META-ANALYSIS OF THE IMPACT OF ADOPTION OF IFRS ON FINANCIAL REPORTING COMPARABILITY, MARKET LIQUIDITY AND COST OF CAPITAL

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Meta-analysis of the Impact of Adoption of IFRS on Financial Reporting Comparability, Market Liquidity and Cost of Capital

A large number of empirical studies have addressed the effects of adoption of IFRS, but the results have been mixed. We use a meta-analysis of 56 empirical studies with 1,265 effect sizes to determine the impact of adoption of IFRS on financial reporting comparability, market liquidity, cost of equity, and cost of debt. This approach provides an objective view of the empirical results, in contrast to narrative reviews which offer subjective conclusions. We find that IFRS adoption has increased financial reporting comparability, market liquidity, and reduced the cost of equity. For cost of debt, a decrease is observed only for voluntary adoption. Our meta-regression analysis explains the variation in the observed effect of adoption of IFRS across mandatory and voluntary adoption of IFRS, and choice of measures, control variables, estimation methods, and the strength of the empirical results. We emphasise the importance of these study characteristics and call for further studies focussing on the cost of debt and also studies using recent data to reflect the changes in IFRS. This study should be of interest to regulators and policymakers as they are expected to assess the impacts of adoption of IFRS.

Key words: Cost of equity; Cost of debt; Financial reporting comparability; IFRS adoption; Market liquidity; Meta-analysis.

This study uses meta-analysis of existing empirical studies on the impact of adoption of IFRS to obtain an objective view on the impact on financial reporting comparability, market liquidity, and cost of capital - equity and debt. Adoption of IFRS is one of the few research areas in accounting with direct policy implications (Daske *et al*., 2008). For example, in the EU, adoption of IFRS triggered policy changes in governance structures and other institutional settings of member countries. Jindrichovska and Kubickova (2016) find that in the Czech Republic, IFRS adoption improved financial reporting quality which accelerated the transition from a centrally-planned economy to a market-based economy. Concerns about the cost of reporting under IFRS (Lai *et al*., 2013; Stent *et al*., 2017), especially for smaller companies (Bradbury and van Zijl, 2006), influenced the form of adoption of IFRS in countries such as Australia and New Zealand.

The level of attention researchers and practitioners have given to adoption of IFRS over the past decade is therefore not surprising. However, to date, empirical studies on the effects of adoption of IFRS have produced mixed results. For example, Jones and Finley (2011) and Yip and Young (2012) find an increase in financial reporting comparability but Bischof (2009) and Callao *et al*. (2007) find a decrease in comparability. Also, Hail and Leuz (2007) find an

increase in market liquidity for firms in the EU but Daske, *et al*. (2008) find an increase in liquidity only for firms in EU countries with strong enforcement. These studies report mixed results because they differ in the choice of measures used and modelling of the financial reporting effects being examined and use different data sets. This raises concerns regarding the contribution of academic research to standard setting (Fülbier *et al*. 2009) and policymaking.

In addition to empirical studies, there have also been narrative reviews of the set of existing studies, such as De George *et al*. (2016), ICAEW (2014) and Soderstrom and Sun (2007), which examined the evidence on the financial reporting and capital market effects of adoption of IFRS. Narrative reviews cover large pools of studies to draw conclusions and suggest opportunities for future research. They analyse the literature on several themes and include studies with different sample sizes, methodologies, time periods, and settings. Typical of narrative reviews, these studies have drawn subjective conclusions which, at least in part, further complicate the debate on the effects of IFRS adoption. Ahmed and Courtis (1999) and Habib (2012) thus argue that narrative reviews do not allow researchers to draw systematic conclusions.

In contrast, we use meta-analysis which reconciles mixed evidence into a single statistic to provide the basis for a quantitative generalisation and has the advantage of correcting for sampling and statistical errors inherent in some individual studies to enhance the precision of the findings. It provides an overall view of the results found in the individual empirical studies but without the subjectivity inherent in conclusions drawn in narrative reviews of adoption of IFRS. Thus, results from meta-analysis should reduce the difficulty of making policy decisions based on the mixed evidence from the individual empirical studies and the subjective conclusions drawn in narrative reviews.

Research on the adoption of IFRS has aimed to determine whether the objectives of adoption of IFRS to enhance the quality of financial reporting (Daske and Gebhardt, 2006) and improve the efficiency of capital markets have been achieved. For instance, research by Lang *et al.* (2010) and Jones and Finley (2011) suggest that the application of common international standards, such as IFRS, should result in improved comparability of financial information and disclosure with expected capital markets benefits such as enhanced market liquidity and reduction in the cost of capital.

Comparability of financial information occurs when firms apply the same accounting standards to similar economic events and operations and produce similar accounting information (Barth *et al.*, 2012). In a liquid market, investors are able to buy and sell securities at fair prices. Liquidity is indicated by change in ownership, ease of access to the debt market,

and liquidity factors such as decreases in the number of trading days with zero returns, the price impact of trade, and the bid-ask spread. From the perspective of improved resource allocation in the economy, it is important that cost of capital reflects the economic characteristics of companies and their environment, free of distortions that might result from inadequate financial reporting.

In jurisdictions where IFRS is adopted, it is often difficult to distinguish the impact of accounting standards changes from other regulatory changes and institutional factors such as the strength of law and standards enforcement. For example, both the EU Market Abuse Directive (Directive 2003/6/EC) in 2003 and the Transparency Directive (Directive 2004/109/EC) in 2004 have similar objectives to the adoption of IFRS (Christensen *et al.*, 2013). Countries such as Germany and Spain made concurrent policy changes to accommodate the adoption of IFRS which led to decreased earnings management and increased liquidity but Ernstberger *et al.* (2012) argue that it is difficult to trace these outcomes to any specific change made to the reporting environment.

Empirical research does not provide consistent results for the effect of adoption of IFRS because of differences in institutional settings and possible concurrent regulatory changes around the time of adoption of IFRS. For example, Lang et al. (2010) and Jayaraman and Verdi (2014) reach different conclusions even though both papers use same measure of comparability, similarity between earnings and stock returns. Lang *et al*. (2010) use a sample of firms from 47 IFRS adoption countries while Jayaraman and Verdi (2014) use a sample of 15 EU countries with different institutional setting but have similar EU regulations. The motivation of our study is to reconcile these differences in empirical results and provide objective conclusions on the financial reporting and capital markets effects.

The contributions of this paper are threefold. Firstly, our study complements the narrative reviews in ICAEW (2014) and De George *et al.* (2016) on the effects of adoption of IFRS. These reviews cover broad areas such as transparency, cost of capital, cross-border investment, and comparability of financial reports and our study is the first to use meta-analysis to examine the impact of IFRS adoption on financial reporting comparability, market liquidity, and the cost of capital. Secondly, our study provides an additional application of the meta-analysis methodology by exploring the factors that influence the effects of adopting IFRS. Finally, it contributes to the continuing debate on the economic consequences of adopting IFRS.

Our study complements and extends the meta-analysis study on the effects of adoption of IFRS by Ahmed *et al.* (2013). Their study focused on the impact of adoption of IFRS on the value relevance of reported book value of equity and earnings, discretionary accruals, and

analysts' earnings forecast accuracy. In contrast, our study examines the impact of adoption of IFRS on comparability, market liquidity, cost of equity and cost of debt and the methodology we employ differs from Ahmed *et al.* (2013) in two respects. Firstly, the meta-analytic model we employ includes the application of Fisher's Z-transformation to correct for undesirable statistical properties and problematic standard errors in the estimated effect sizes (Lipsey and Wilson, 2001, p.63).[1] Secondly, we use meta-regression analysis to explain the significant variation in the empirical results across studies by examining the potential effect of differences in study characteristics such as mode of adoption, choice of measures for the IFRS adoption effects, control variables, estimation methods, and various other factors affecting strength of the empirical results. Controlling for such characteristics that differ across studies has the potential of reducing the apparent heterogeneity in the effects of adoption of IFRS. Also, the use of meta-regression helps to account for all the moderating variables simultaneously in a multiple regression format to determine the relative explanatory power of each of the variables (Heugens *et al*., 2009; Miller and Cardinal, 1994).

It is important to examine the impacts of adoption of IFRS on comparability of financial reporting as the key objective of the IFRS Foundation is to develop financial reporting standards that ensure that financial statements are comparable and enable participants in the capital markets to make better economic decisions, and improve capital market efficiency. However, after more than a decade of research into the effects of adoption of IFRS, one cannot draw definitive conclusions on the size and direction of the effect of adoption of IFRS, even though empirical studies have tried to put forward theoretical underpinnings for the potential effect of adoption of IFRS. Our findings have the potential to give an indication of how far this objective has been achieved and also help in framing conclusions on the overall relationship between IFRS adoption and comparability, market liquidity and cost of capital.

From our meta-analysis of 56 empirical studies with 1,265 effect sizes, we find that, overall, there is an increase in comparability, market liquidity and a reduction in the cost of equity after adoption of IFRS. Reduction in the cost of debt is observed for voluntary adoption but not mandatory adoption. We find that the mixed results in empirical studies are potentially due to the mode of adoption, differences in choice of measures, control variables, estimation methods, and various factors affecting the strength of the results. Finally, we observed a high concentration on cross-country samples and equity market research among the empirical studies on IFRS adoption.

[1] See Lipsey and Wilson (2001, p. 9) for a discussion of this issue.

The studies analysed in the main focus on years prior to 2010. Only six studies consider later years. The IFRS standards have recently gone through significant changes. For example, IAS 17 Leases, IAS 18 Revenue, and IAS 39 Financial Instruments Recognition and Measurement have been replaced with new standards IFRS 16 Leases, IFRS 15 Revenue from Contracts with Customers, and IFRS 9 Financial Instruments, respectively. As a result, overall conclusions drawn on the impact of IFRS adoption may not be reflective of these recent changes.

A meta-analysis is subject to various limitations. First, meta-analysis can be criticised for combining apples and oranges as it combines results from different empirical studies which use different measures and research design and test different hypotheses. We mitigate this limitation by focussing on just three impacts of adoption of IFRS: comparability, market liquidity, and cost of capital, and consider these impacts separately. We also use random effects rather than fixed effects and include controls for factors that may cause the empirical studies to differ. A second limitation of meta-analysis is that it combines results from studies that differ in quality, as indicated by the quality of the journals in which the studies were published. However, excluding some studies, because they were published in lower ranked journals, increases the 'file drawer' problem, detracts from the objectivity of meta-analysis and adds to difficulties in replication. We address this issue by including studies from both high-quality and low-quality journals and include an indicator variable which differentiates between high-quality and low-quality journals. We test this indicator variable to determine whether studies published in high-quality journals generate systematically different results from those published in low-quality journals.

The rest of this paper is structured as follows. The next section reviews the research evidence on the effects of adoption of IFRS on comparability, liquidity, and the cost of capital and develops our hypotheses. The following sections describe the meta-analysis procedure and the meta-regression model. The next section presents the results and analysis of our findings and the final section concludes the study.

RESEARCH EVIDENCE AND HYPOTHESES

In 2006, the Institute of Chartered Accountants in England and Wales (ICAEW) conducted a survey to ascertain the perceptions of users and preparers on adoption of IFRS. The survey found that a significant minority believed that IFRS had made financial reporting worse and about 24% of users and 14% of preparers opposed the adoption of IFRS (ICAEW, 2007). Ball (2006) argues that while IFRS adoption aims to create uniformity it does not necessarily

enhance financial information comparability. Differences in country and institutional settings may lead to different outcomes from adoption of IFRS. However, the narrative reviews by ICAEW (2014) and De George *et al.* (2016) conclude that IFRS adoption has improved transparency, financial information quality, and comparability of financial reporting. This section reviews the evidence from prior research on the impact of IFRS on financial reporting comparability, market liquidity, cost of equity, and cost of debt.

Adoption of IFRS and financial reporting comparability

There is no prescribed measure of comparability and therefore lack of consensus on this issue in the IFRS adoption literature is not surprising. For instance, ICAEW (2014) finds that while some studies define comparability in terms of application of accounting choices, compliance with standards, and influence of fair value, others focus on measures such as the synchronicity of accounting-based information and market-based information, stock returns comparability, association between earnings and cash flows, the level of information transfer, similarity of accounting ratios.

Cole *et al.* (2011), Haller and Wehrfritz (2013), and Kvaal and Nobes (2010, 2012) examines the application of accounting choices by firms over time and across different countries. This approach of measuring comparability is described by Gross and Perotti (2017) as the input-based measure of comparability. While Cole *et al*. (2011) use a survey of firms across industrial goods and services and the technology industry across Belgium, Germany, the Netherlands, and the UK, Kvaal and Nobes (2010) examine the 2005/2006 annual reports of firms from 9 industries across Australia, France, Germany, Spain, and the UK. Kvaal and Nobes (2012) compares the 2005/2006 annual reports to the 2008/2009 for the same countries as in Kvaal and Nobes (2010) and Haller and Wehrfritz (2013) compares the 2005 annual reports 2009 for Germany and the UK. annual reports to determine whether national patterns persist after adoption of IFRS. Though these studies found clear evidence of national patterns in financial reporting after the adoption of IFRS, Kvaal and Nobes (2010) find that the evidence is more pronounced in France and Spain even though these countries made substantial policy changes to accommodate IFRS requirements. The possible explanation was that the national standards of these countries were significantly different from IFRS, thus making the transition process more difficult and slower. Cole *et al.* (2011) identified country features such as the economic, political, legal, and tax systems as being the main determinants influencing accounting choices.

Glaum *et al.* (2013) analyse the determinants of compliance and argue that compliance is a major driver for comparability. They find substantial noncompliance with IFRS standards, particularly for the disclosure requirements of IFRS 3 (Business Combinations) and IAS 36 (Impairment of Assets), and thus a low level of comparability. They find that firm-specific factors such as the type of auditor and the existence of audit committees as well as country-specific factors such as the strength of legal systems and the size of stock markets explain noncompliance. Other studies such as Christensen and Nikolaev (2009) and Cairns *et al.* (2011) consider comparability in terms of the application of fair value measurement. The authors find that comparability is low when firms have the option to apply accounting policies such as fair value.

Some other studies focus on the similarities in economic events of firms in developing comparability measures. These measures are developed on the premise that firms that face similar economic events are required to report similar accounting and market measures. These measures are particularly relevant to users of financial reports who would be interested in the outputs of the financial reporting process. Thus, users can easily compare the financial information of firms that are faced with similar economic events and apply the same accounting standards. We review the following empirical studies.

De Franco *et al*. (2011) is arguably one of the influential empirical papers to pioneer the output-based measure of comparability which has the advantage of avoiding the accounting choice to focus on and the weight to be placed on each accounting choice. They measure comparability as a functional form that links earnings and stock returns. Barth *et al*. (2012) provide a modification of De Franco *et al*. (2011). The measure used by Barth *et al*. (2012) differs from that of De Franco *et al*. (2011) in two respects. First, while De Franco *et al*. (2011) regress earnings on stock returns, Barth *et al*. (2012) regress stock price (stock return, subsequent year's cash flows) on earnings and equity book value (earnings and change in earnings, earnings). Second, De Franco *et al*. (2011) provide time-series estimates of comparability while Barth *et al*. (2012) assess comparability on the cross-sectional relationship.

Yip and Young (2012) use three measures of comparability. The first measures the degree of information transfer and the authors explain, based on evidence documented in prior literature (Kim and Li, 2011; Alves *et al.*, 2010) showing there is information transfer between announcing firms and the stock returns of peer non-announcing firms, that the stock market reacts by readjusting the share price of peer non-announcing firms. The second measures the similarity of the information content of equity and the information content of book value by

applying the Ohlson (1995) model which regresses firm's market value on net income and equity book value. From analysing 17 European countries over the period 2002-2007, Yip and Young (2012) find that mandatory adoption of IFRS improves cross-country information comparability. The third measure adapts the measure developed by De Franco *et al*. (2011) to the application of IFRS and find that mandatory adoption of IFRS improves comparability of firms with similar characteristics.

Brochet *et al.* (2013) use three different measure of comparability developed by DeFond *et al*. (2011), De Franco *et al*. (2011), and Yip and Young (2012) and find evidence of reduction in abnormal returns to insiders' share purchases which are inferred to be attributable to enhanced comparability. Brochet *et al.* (2013) explain that where local standards and IFRS are similar such as the UK market, any reduction in private information (abnormal returns to insider trading) can be attributed to increased public information which drives financial statements to be comparable and helps investors to make better estimates of the value of firms. Neel (2017) also uses three alternative measures of comparability to examine the impact of accounting comparability on economic outcomes following adoption of IFRS. The comparability measures used by Neel (2017) are those developed by De Franco *et al*. (2011) and Barth *et al*. (2012) and a third measure which investigates the association between cash flows and accruals. Neel (2017) examined 41 countries over the period 2001-2008 and find that firms associated with increase in comparability across countries following adoption of IFRS experience greater capital markets benefits.

Liao *et al*. (2012) examine the cross-country comparability between firms in France and Germany over the period 2006-2008. They measure comparability by comparing the coefficient on the association between stock price and earnings and book value for firms in France and Germany. They find that comparability increases only in the first year of adoption of IFRS but reduces in the two years following. The authors argue that in the first year of adoption both French and German firms restate the accounting amounts in a similar fashion but differences in institutional settings across the two countries provide incentives for managers to apply IFRS differently.

Other studies such as DeFond *et al*. (2011) and Jones and Finley (2011) take a different approach to measuring comparability. DeFond *et al*. (2011) define uniformity as the number of industry peers using the same accounting measure and implicitly measure comparability as the number of firms mandatorily applying IFRS divided by the number of firms that use local accounting standards prior to mandatory adoption of IFRS. Jones and Finley (2011) examine comparability by the extent of the variability in accounting ratios. Jones and Finley (2011)

hypothesise that firms with similar characteristics and financial reporting standards are more likely to produce comparable ratios. Based on this hypothesis, they find a significant reduction in the variability of accounting ratios after the adoption of IFRS, suggesting an increase in comparability within industry and country, as well as across firms of similar sizes.

In contrast to the studies discussed above that find a positive impact on comparability from adoption of IFRS, Bischof (2009), Callao *et al.* (2007), and Lang *et al*. (2010) find negative or no impact of adoption of IFRS on comparability. Bischof (2009) analyses the impact of adoption of IFRS on debt markets, specifically of European bank's application of IFRS 7 (Financial Instruments: Disclosures). Bischof (2009) finds that disclosure varies significantly across the firms in the 28 European countries in the study sample, an indication of less comparability across countries following adoption of IFRS and notes that comparability is related to both IFRS adoption and enforcement of the standards. Callao *et al.* (2007) measure comparability by the similarities between accounting numbers and financial ratios under Spanish accounting standards and IFRS. They find that certain aspects of local standards continued to be applied even after the adoption of IFRS and this adversely affected comparability.

Lang *et al*. (2010) examine 23 IFRS adoption countries and 23 non-IFRS adoption countries over the period 1998-2008 and use the measure developed by De Franco *et al*. (2011). Lang *et al*. (2010) argue that differences in enforcement and implementation of IFRS across countries, the principles-based standards offered by IFRS, and the managerial discretion erode the benefits of adopting a single set of accounting standards. The difference-in-difference test indicates that although adoption of IFRS led to an increase in earnings comovement the quality of information environment declined. Beuselinck *et al.* (2007) argue that earnings and cash flows converge over time but find that adoption of IFRS did not immediately facilitate the convergence of earnings and cash flows.

The results reported for the above studies reflect substantial differences in the operationalization of the construct of comparability. As Taplin (2011) noted, the methods and measures of comparability should be consistent because they are essential in developing policies to improve comparability. If there is no clear understanding of comparability and how it should be measured, then the concept of comparability loses significance. Though some studies concur on the comparability benefit of adoption of IFRS, there are a significant number of studies that report contrasting results even for studies that employ the same measure of comparability (For example, Brochet *et al.*, 2013 and Lang *et al*., 2010). We thus examine the

mixed results in empirical studies and identify factors such as the setting, the sample size, sample period, and the study design that could impact empirical results. We hypothesise that:

H_{1a}: Adoption of IFRS has an impact on firms' financial reporting comparability.

H_{1b}: The impact on firms' financial reporting comparability is moderated by differences in study characteristics.

Adoption of IFRS and market liquidity

ICAEW (2014) notes that most empirical research in accounting measures liquidity by "the number of trading days with zero returns, the price impact of trades, and the bid-ask spread". These measures of liquidity have been used in a significant number of empirical studies in the accounting and finance literature. We review below the papers relevant to our study.

Hail and Leuz (2007) examine liquidity in the capital market after the adoption of IFRS in the EU using all three of the measures discussed in ICAEW (2014). Hail and Leuz (2007) find that the number of trading days with zero returns and the price impact of trades both decline after adoption of IFRS thus suggesting an increase in liquidity. However, the increase was modest in size. Hail and Leuz (2007) thus argue that the impact on liquidity could be attributed to factors such as regulatory changes rather than adoption of IFRS. Daske *et al.* (2008) extended the work of Hail and Leuz (2007) to include non-EU countries and found a drop in the bid-ask spread, ranging from 3% to 6%, thus indicating an increase in liquidity. However, in Daske *et al.* (2008) the liquidity change applied only to countries with strong law enforcement and the authors thus question the attribution of capital market effects for mandatory adopters solely to adoption of IFRS. Similarly, Christensen *et al*. (2013) find that firms that made enforcement changes but did not switch to IFRS still experienced increased liquidity and find little evidence of increased liquidity for firms in countries with no substantial enforcement change.

Drake *et al.* (2010) examine whether there is a positive effect on liquidity from the adoption of IFRS. They find an increase in liquidity after the adoption of IFRS and attribute this to increased comparability. The authors do not provide an empirical test of the comparability effect but claim that the increase in market liquidity for firms with higher pre-adoption information environment is attributable to increase in comparability and find no impact of accounting quality on liquidity. This finding by Drake *et al.* (2010) is reinforced by Neel (2017). However, there are substantial differences in the research designs of Drake *et al.* (2010) and Neel (2017). Drake *et al.* (2010) use difference-in-difference design and measure liquidity as turnover ratio, two market depth measures, bid-ask-spread, and a composite of the four measures. Neel (2017) uses price impact, trading cost, and bid-ask-spread as measures of

market liquidity and find that accounting quality has a second-order effect on liquidity. Further, Neel (2017) finds that the increase in liquidity occurs even in countries with weaker institutions and in countries that did not make positive regulatory changes prior to the adoption of IFRS. The results indicate that strong institutions and regulatory improvements are not the sole drivers of increased liquidity.

Shibly and Dumontier (2014) investigate the impact of the information environment on liquidity following adoption of IFRS. They use firm size as a measure for firms' information environment with small firms having weak information environment and large firms a strong information environment. They find that market liquidity increases only for small firms indicating that IFRS adoption has a significant effect on a weak information environment. However, their study did not address the effect of other institutional changes such as in regulation around the time of the adoption of IFRS.

Platikanova and Perramon (2012) measure liquidity by an industry-adjusted measure of bid-ask-spread, price impact, and zero returns. The authors examine a sample of firms in France, Germany, Sweden, and the UK from 2005-2011 and find that market liquidity is lower in industries with fewer comparable firms. This is because investors use the financial information of similar firms to assess the value of a given firm. Therefore, fewer comparable firms imply less information for valuation. They also find that market liquidity decreases for firms where there are large adjustments in net income in the year of adoption of IFRS. They explain that larger adjustments in financial statements increase uncertainty in the capital market and this affects investment decisions.

Daske *et al.* (2013) argue that the reporting behaviour of firms affects liquidity. The authors define reporting behaviour as the level of transparency exhibited by firms in their financial reporting. They use accruals as a measure for transparency with the lower (higher) the accruals, the higher (lower) the level of transparency. Based on this argument, they expect and observe that firms that are more transparent after the adoption of IFRS have higher liquidity. Daske *et al.* (2013) also assess liquidity change using price impact and bid-ask spread and by classifying their sample into firms that adopt IFRS only in name ('label adopters') and firms that make policy changes to improve their reporting practice ('serious adopters'). They define serious adopters as firms that during or after IFRS adoption make concurrent efforts to improve their financial reporting. They observe that liquidity increases for serious adopters relative to label adopters. This effect can be attributed to serious adopters exhibiting a lower level of uncertainty and thus being more attractive to investors. The authors conclude that liquidity change is more likely to reflect firms reporting behaviour than the adoption of IFRS.

A number of studies have used measures of liquidity other than the measures specified in ICAEW (2014). Hong *et al*. (2014) measure liquidity as the proceeds from investment and find an increase in liquidity. Covrig *et al*. (2007), DeFond *et al*. (2012) (voluntary adoption), Florou and Pope (2012), and Hamberg *et al*. (2013) measure liquidity as the change in ownership and find an increase in liquidity, Beneish et al. (2015) measure liquidity as change in equity and debt investment and find an increase in both equity and debt investment but the change in equity investment is influenced by the quality of governance, level of economic development, and rights of creditors.

In contrast to the studies discussed above that focus on the equity market, Alexandre and Clavier (2017) focus on liquidity in the debt market. The measure the author employ is based on the volume of loans provided by banks. For a sample of European firms, Alexandre and Clavier (2017) find that the impact on liquidity is greater for smaller and constrained firms but is dependent on the enforcement regime.

The prior literature has shown diversity in the choice of measures of market liquidity and study characteristics. While the results of the studies are consistent with an increase in market liquidity surrounding adoption of IFRS the empirical literature is unclear on whether the effect reflects adoption of IFRS. A number of studies attribute the effect to factors such as improvements in financial securities trading (Brown, 2013), comparability (Drake *et al.*, 2010; Neel, 2017; Platikanova and Perramon, 2012), regulatory changes (Shibly and Dumontier, 2014), reporting behaviour (Daske *et al.*, 2013), and level of enforcement (Alexandre and Clavier, 2017; Daske *et al.*, 2008). We thus examine whether adoption of IFRS on liquidity and how the different study characteristics impact the results in the empirical studies. We test the following hypothesis:

H_{2a}: Adoption of IFRS has an impact on market liquidity.

H_{2b}: The impact on market liquidity is moderated by differences in study characteristics.

Adoption of IFRS and cost of capital

An efficient capital market should contribute to a reduction in the cost of capital. Thus, if IFRS adoption enhances capital markets then it should be expected to reduce companies' cost of capital (ICAEW, 2014). This section looks at the empirical evidence on the impact of IFRS adoption on the cost of equity and the cost of debt.

Evidence from the equity market

In addition to investigating the effect of IFRS adoption on market liquidity, Hail and Leuz (2007) also examine the effect on the cost of equity. The authors measure cost of equity capital as implied cost of equity which is an average of the estimates from the models developed by Claus and Thomas (2001), Gebhardt *et al*. (2001), Easton (2004), and Ohlson and Juettner-Nauroth (2005). For their full sample period of 2001-2005, they find a marginal decrease in the cost of equity for IFRS adopters relative to non-IFRS adopters. For the sub-sample period of 2004-2005, the authors report an increase in the cost of equity by 11 basis points but suggest that the result from the sub-sample is more likely to be attributed to firm-specific characteristics such as total assets, market value and leverage, rather than the adoption of IFRS. Daske *et al*. (2008) use the same cost of equity measure and sample period as in Hail and Leuz (2007) but adopt a different research design. While Hail and Leuz (2007) use OLS, Daske *et al.* (2008) use difference-in-difference (DID) design. Daske *et al*. (2008) report a 26 basis points decrease in the cost of equity capital in the year prior to the IFRS transition period. They conclude that their results are likely to be driven by institutional factors such as changes in enforcement.

Both Palea (2007) and Gkougkousi and Mertens (2010) examine a sample of financial firms in the EU but use different measures of the cost of equity. Palea (2007) estimates the cost of equity capital using quarterly data and employ the Gordon growth model proposed by Gordon and Shapiro (1956). Gkougkousi and Mertens (2010) estimate the cost of equity capital using the implied cost of equity for a sample from 2002-2007. Both studies find that the cost of equity capital reduces after the adoption of IFRS. Gkougkousi and Mertens (2010) provide further evidence which suggests that financial institutions with higher use of fair value accounting show a lower cost of equity. The explanation offered is that adoption of IFRS reduces information asymmetry and that fair value accounting provides an early warning signal to investors of possible asset price crash, and hence is preferred to historical cost accounting. The reduction in the asymmetry of information and the preference for fair value accounting may lead to a lower cost of equity. This explanation is contrary to the belief held by some market observers that fair value accounting increases the perceived risk level of firms because of higher reported fluctuations in asset prices and that this is likely to translate into an increase in the cost of equity.

Lee *et al*. (2008) use both price-earnings-growth (PEG) and abnormal earnings growth (AEG) models to examine the impact of mandatory adoption of IFRS on the cost of equity for high-quality and low-quality financial reporting and enforcement environments. They find no significant impact of adoption of IFRS on the cost of equity for firms in a low-quality reporting

and enforcement environment, whereas firms in a high-quality reporting and enforcement environment, such as the UK, show a significant decrease in the cost of equity.

Li (2010) uses implied cost of equity capital equal to the average of the measures developed in Claus and Thomas (2001), Gebhardt *et al.* (2001), Gode and Mohanram (2003), and Easton (2004). The study examines mandatory adopters of IFRS and uses voluntary adopters as a control sample in a DID design to determine whether the cost of equity reduces in the EU. For a sample period of 1995-2006, the author finds that the cost of equity decreases by 47 basis points for mandatory IFRS adopters relative to voluntary adopters. The reduction in the cost of equity is present only in firms from countries with strong law enforcement, suggesting that the quality of law enforcement is an important determinant of the effect on the cost of equity. Li (2010) also shows that when the transition years, 2004 and 2005, are excluded from their sample the cost of equity decreases by 86 basis points for mandatory adopters. A further test shows that the reduction in the cost of equity is driven by increased disclosure and comparability. Castillo-Merino *et al*. (2014) find similar results for the Spanish market using the PEG (Easton, 2004) model as a measure for cost of equity for the period 1999-2009.

Hong *et al.* (2014) examine the effect of IFRS adoption on the cost of equity in the context of IPOs. The authors hypothesise that improved disclosure and comparability reduces the need to underprice IPOs because of the reduction in information asymmetry and uncertainties surrounding equity issues after the adoption of IFRS. The reduction in IPO underpricing suggests a decrease in the cost of raising equity capital. They also test whether their results persist based on the extent of accounting changes and the level of implementation credibility. The number of additional disclosures required by IFRS compared to local GAAP and the number of differences between the requirements of IFRS and local GAAP is used as measures for the extent of accounting changes, and the rule of law is used as a measure for implementation credibility. Using propensity score matching (PSM), the authors found that the effect of adoption of IFRS is greatest for firms with increased disclosure and firms in countries with strong implementation credibility.

Houqe *et al*. (2016) focus on evidence from New Zealand and employ the modified-PEG (Easton, 2004) model and also a publicly available PwC estimate of cost of equity as alternative measures for the cost of equity. Both measures show a reduction in the cost of equity after adoption of IFRS by New Zealand firms.

Persakis and Iatridis (2017) estimate the cost of equity as the average of the implied cost of equity capital estimates from the application of Easton (2004) and Ohlson and Juettner-Nauroth (2005) models for the period 2000-2014. From examination of European zone and Asian

countries, they find that after adoption of IFRS, the cost of capital reduces for firms in both sets of countries, but only for firms in countries with stronger investor protection and firms with higher earnings quality.

Kim *et al*. (2014) estimate cost of equity from the PEG model (Easton, 2004) and two alternative measures from the models developed by Ohlson and Juettner-Nauroth (2005) and Gebhardt *et al.* (2001). They focus on a sample of voluntary adopters from 34 countries for the period 1998-2004. They find that cost of equity is lower for IFRS adopters than non-adopters and is lower for firms in countries with strong institutions. However, the impact of adoption of IFRS in reducing the cost of equity capital is greater for firms in countries with weak institutions than for countries with strong institutions.

Daske (2006) studies a set of German firms that voluntarily adopt IFRS for the period 1993-2002. The author estimated the cost of equity using the Easton (2004) and Gebhardt *et al.* (2001) models. Daske (2006) finds that IFRS adoption does not have any impact on cost of equity and in fact cost of equity increases during the IFRS transition period. Daske *et al*. (2013) use a similar measure for the cost of equity as in Hail and Leuz (2007) (see above) and a sample period from 1990-2005. They find similar results to Daske (2006) with respect to voluntary adoption.

Karamanou and Nishiotis (2009) measure the cost of equity by employing the models developed in Claus and Thomas (2001) and Ohlson and Juettner-Nauroth (2005). From a sample of voluntary adopters from 8 countries for the period 1988-2002, they find a significant reduction in the cost of equity capital.

Dargenidou *et al*. (2006) examine 16 European countries over the period 1994-2003. The authors measure the cost of equity as equity risk premium and find that change in accounting regime is associated with transitory cost. Partington (2006) however, criticises the claims made by Dargenidou *et al*. (2006) because Dargenidou *et al*. (2006) do not provide empirical test to support that a change accounting regime is associated with higher cost of equity at least in the short term.

Paugam and Ramond (2015) focus on a specific accounting standard, IAS 36, Impairment of Assets. The sample covers French companies for the period 2006-2009. The authors measure the cost of equity capital as the average of PEG, modified-PEG model by Easton (2004) and the measure developed by Gode and Mohanram (2003). They report that impairment-testing disclosure reduces the cost of equity capital because such disclosure reduces information risk. They also find that firms that do not disclose impairments, even when there are indications of impairment, do not experience a reduction in cost of equity.

The models used most frequently for the estimation of the cost of equity capital are Claus and Thomas (2001), Gebhardt *et al*. (2001), the original PEG and modified-PEG by Easton (2004), and Ohlson and Juettner-Nauroth (2005). While some studies use a single measure, most of the studies on cost of equity capital use an average of two to four of these measures. Even though these measures reflect similar underlying assumptions the results reported in the literature differ with different sample sizes and sample periods. We thus hypothesis that:

H_{3a}: Adoption of IFRS has an impact on firms' cost of equity.

H_{3b}: The impact on firms' cost of equity is moderated by differences in study characteristics.

Evidence from the debt market

The debt market remains the most important avenue for raising capital and accounting information plays a major role in defining the terms and conditions of debt contracts. Over the period 2000-2011, the size of the US and European debt markets was three times the size of the equity market and firms accessed the debt market more than the equity market (ICAEW, 2014; Florou and Kosi, 2015). Despite this dominance of the debt market over the equity market, the impact of IFRS adoption on the cost of debt has been less well researched. Moreover, as the information needs of lenders are different from those of equity investors, generalisation of the evidence from research on the equity market to the debt market is problematic (Florou and Kosi, 2015).

Florou and Kosi (2015) assess the effect of mandatory IFRS adoption on bond issuance and loans for firms in the EU over the sample period 2000-2007. From a comparison of IFRS adopters and non-IFRS adopters, the authors find that IFRS adopters are more likely to access the public bond market than the private loan market. This is because the adoption of IFRS led to a significant reduction in bond yield spreads while the cost of loans remained relatively unchanged. They measure yield on public bonds as the spread over government bonds and for the private market the cost of a loan is measured as the basis points over LIBOR. They document that the observed effect is concentrated in firms from countries with a high divergence of local GAAP from IFRS and persisted even for firms in a low financial reporting enforcement.

Chen *et al*. (2015) examine bank loan contracting for mandatory IFRS adopters and non-adopters across 31 countries for the period 2000-2011. In contrast to the findings of Florou and Kosi (2015) regarding private loans, Chen *et al*. (2015) find that the cost of debt, measured by the interest rate on loans, increases by 10 basis points for mandatory adopters relative to

benchmark firms. There are at least two possible explanations for the results in Chen *et al*. (2015). First, the application of fair value accounting from adoption of IFRS is likely to make financial information unreliable for credit assessment. For instance, in the absence of a liquid market for assets, fair value information is relatively subjective which may cause a bias in estimation of leverage. Unreliable financial information on borrowers is likely to result in higher interest rates being demanded by lenders. Second, under IFRS, lenders are likely to incur additional costs in learning and monitoring the financial reporting of the operations of borrowers when assessing credit quality.

Kim *et al*. (2011) focus on voluntary adopters of IFRS and use a sample of non-US firms across 40 countries over the period 1997-2005. The study measures cost of debt as the spread on loans which is calculated as the basis points above LIBOR or other standard rates such as HIBOR, TIBOR, SIBOR or EURIBOR. They find that banks charge lower rates to IFRS adopters than non-IFRS adopters and this result does not differ with respect to the strength of the institutions of a country. They explain that better disclosure resulting from adoption of IFRS reduces the information risk associated with lending, thus reducing the rates offered by lenders to borrowers.

Moscariello *et al.* (2014) examine the UK, a strong institutional setting with local GAAP similar to IFRS, and Italy, a weak institutional setting with local GAAP significantly different from IFRS. These two countries represent, on the one hand, a common-law regime (UK) characterised by strong investor protection and corporate governance, and on the other hand, a code law regime (Italy) characterised by low investor protection. The cost of debt is measured by the interest-debt ratio over the period 2002-2008. The study finds an improvement in the debt contracting process after mandatory adoption which leads to a lower cost of debt in Italy. The authors explain that the similarities between UK GAAP and IFRS made it unlikely that there would be a significant impact of IFRS adoption on UK firms.

Bhat *et al.* (2014) examine the impact of IFRS adoption on spreads on credit default swaps (CDS) for 16 countries over the period 2003-2008. Using the US as a benchmark, they find a decline in the spreads on CDS following mandatory IFRS adoption.

Improvements in transparency reduce uncertainties surrounding a firm and reduce information asymmetries between investors and firms. When information asymmetry is high, outside investors will, for example, seek a higher price for their investment (price protection) to defend themselves against the risks that insiders with superior information will take advantage of them. In contrast, with reduced uncertainties and information asymmetries,

outside investors require less price protection and thus companies can raise capital at a lower cost.

Although several of the studies reviewed above suggest a reduction in the cost of debt following adoption of IFRS, it is not clear whether the change in the cost of debt can be directly attributed to adoption of IFRS or results from the operation of other factors. Therefore, we hypothesise that:

H_{4a}: Adoption of IFRS has an impact on firms' cost of debt.

H_{4b}: The impact on firms' cost of debt is moderated by differences in study characteristics.

META-ANALYSIS PROCEDURE

To examine the relationship between IFRS adoption and financial reporting comparability, market liquidity and cost of capital, and to identify the study characteristics that affect these three dimensions, we carried out the following steps. First, we identified relevant empirical studies. Second, we coded the selected studies for the meta-analysis to represent the relationships being examined and the study characteristics that moderate the relationship. Third, we calculated for each primary study, the effect size, which is a measure of the relationship being tested, the mean effect size and a test for heterogeneity in the effect size estimate. Finally, we identified the possible sources of heterogeneity and used meta-regression to assess the impact of these sources.

Identification of relevant studies

For the literature search, we followed the procedure established in Kepes *et al*. (2013), Ringquist (2013) and Stanley *et al*. (2013). The procedure typically involves first identifying the empirical papers that address the research questions of interest and then making a judgement as to the inclusion of a particular paper in the meta-analysis. In identifying the relevant studies, we started with electronic searches using keywords or search terms such as "IFRS", "IFRS adoption", "mandatory IFRS adoption", "voluntary IFRS adoption", "International financial reporting standards", "International reporting standards", "International financial reporting", and "International accounting standards". We also required that the search contained the following terms: "comparability", "harmonisation", "diversity", "information transfer", "liquidity", "trading cost", "economic consequence", "cost of capital", "cost of equity", "cost of debt", "loan", and "debt". The electronic search was done in the

following databases: ProQuest, Business Source Complete, JSTOR, EBSCO, ScienceDirect, Wiley, Taylor & Francis, Edward Elgar, Emerald, Google Scholar, and SSRN.

To ensure that our search for relevant papers was exhaustive, we extended our search by scanning the references in review papers such as ICAEW (2014) and De George *et al*. (2016). Next, we manually went through the reference lists of all the initially identified papers to search for additional studies that had not been captured in the electronic search.

To make a judgement as to what papers to include, we first went through the title and abstract and subsequently the full text to exclude papers that do not report empirical results. We excluded papers that did not report the relevant statistics for calculation of the effect size. Examples of some empirical papers that were excluded are, first, some studies such as Beuselinck *et al*. (2007), Barth *et al*. (2012), and Khan *et al*. (2017) which do not provide *t*-statistic, *z*-statistic or *p*-values and indicate significance only by asterisks. Second, Christensen *et al*. (2007), Lang *et al*. (2012), and Fang *et al*. (2015) provide the relevant statistics but combine firms that adopt US GAAP or IFRS which makes it impossible to isolate the IFRS adoption effect. Third, Bischof (2009) and Kvaal and Nobes (2012) do not provide multivariate or regression analysis, Goh *et al*. (2016) provide multivariate analysis but do not include an IFRS variable as an independent variable, and Gebhardt and Novotny-Farkas (2018) reported only *R*-squared as a measure of comparability.

We did not apply any exclusion criteria based on the apparent quality of the primary studies; however, we included journal quality as a study characteristic in analysing the sources of heterogeneity in the primary studies. We thus arrived at a final sample of 56 papers that satisfied our inclusion criteria.

Table 1 gives a summary of the sample of the 56 studies (50 published and 6 unpublished). The studies are from the years 2000 to 2018 and cover sample periods from 1989 to 2014. Out of the 56 studies, 13 examine single countries including Australia, Canada, France, Germany, Italy, New Zealand, Spain, Sweden, and the UK, and 43 examine multiple countries. The table also shows whether a study examines mandatory or voluntary adoption or both mandatory and voluntary adoption.

(insert Table 1 about here)

Table 2 provides information on the journals in which the studies were published, the number of studies obtained from that journal, and the ranking of the journals according to the ABDC and ABS rankings.[2]

(insert Table 2 about here)

Most of the studies included in the meta-analysis reported multiple regression results but the results differ across mode of adoption, choice of measure, type of control variables, estimation methods, and factors affecting the strength of the results. Where a study produces multiple effect sizes, some authors suggest that a mean or median effect size should be calculated from the set of effect sizes or selection of one effect size that reflects the overarching research question of the study (Hunter and Schmidt, 1990; Bijmolt and Pieters, 2001; Lipsey and Wilson, 2001). However, that approach does not acknowledge sources of heterogeneity (Cheung and Chan, 2004) and ignores potentially relevant information that contributes to variation in the effect size estimates between and within the primary studies. To mitigate this problem, Dalton *et al*. (2003) and Carney *et al*. (2011) suggest that effect sizes should be reported separately for each regression. This process has the benefit of capturing the full set of relevant information needed for the meta-analysis, in particular, in the analysis of the sources of heterogeneity.

In our sample of 56 studies, 54 studies provided multiple effect sizes. The 56 studies produced a total of 1,265 effect size estimates.

Calculating effect sizes

We measure effect size by the partial correlation coefficient *r*, which shows both the magnitude and direction (Lipsey and Wilson, 2001) of the relationship being tested and also assists in making comparison across studies (Rosenthal, 1991). The calculation of effect size depends on what statistic (*t*-statistic, *z*-statistic, standard error, or *p*-value) is reported in the multivariate analyses in the primary studies. Where *t*-statistic is reported, we compute *r* as a function of the *t*-value and the degrees of freedom. For studies that do not report *t*-statistics, we convert the regression coefficient and the standard errors into *t* or we impute the *t* from the *p*-value; then convert to *r*. We also transform *z*-statistics into *r* for studies that report *z*-statistics for the regression coefficients. However, correlation coefficient (*r*) effect sizes have some undesirable statistical properties (Lipsey and Wilson, 2001; Ringquist, 2013). For example, *r* suffers a

[2] ABDC rankings are issued by the Australian Business Deans Council of Australia. The ABDC ranks journals as A*, A, B and C. ABS rankings are issued by the UK Association of Business Schools. The ABS ranks journals as 4*, 4, 3, 2, and 1.

positive bias because it increases with the number of parameters and the *t*-statistics used in calculating the *r* also increases when the sample size increases. To counter these undesirable statistical properties, the Fisher *Z* transformation is applied to all our estimated effect sizes.[3] The weighted mean effect size and standard error are then calculated based on the random effects model (Borenstein, *et al*., 2007). This assumption is particularly appropriate where the studies analysed vary in terms of the period studied and countries studied; in that case, there will not be a common effect size, rather the different studies will vary in terms of underlying true effect size. The random effects model assumes that beyond sampling error there is excess heterogeneity from differences in the effect size estimates. The variance of the effect sizes in a random effects model is given by $v_i + \tau^2$, where v_i is the within-study variance associated with sampling error and τ^2 is the estimate of the between-study variance (unknown).

Estimation of the weighted mean effect size and standard error for the random effects model starts with estimation of τ^2 from the values estimated for the weights and *Q*-statistic assuming a fixed effect model. The formulas for estimation of the weights and *Q*-statistic in the fixed effect model are shown in Table 3.

(insert Table 3 about here)

Having obtained an estimate of τ^2, the weights for the random effects model are set equal to the reciprocal of $(v_i + \tau^2)$. The weighted mean effect size for a given measure is then computed as the sum of the products of each effect size and its weight, scaled by the sum of the weights. The mean standard error is computed as the square root of the inverse of the sum of the weights. A confidence interval for the weighted mean effect size can then be calculated, or to directly test the significance of the mean effect size, the *z*-statistic is computed by dividing the mean effect size by the mean standard error. The calculations are shown in Table 4.

(insert Table 4 about here)

Sources of heterogeneity

We coded relevant information on the study characteristics which are likely to be the sources of heterogeneity in the effect size results. This information includes the mode of adoption

[3] The undesirable statistical properties are from three sources. First, *r* understates the effects sizes. Second, *r* is restricted to -1≤ *r* ≤ 1. Lastly, the variance of *r* strongly depends on the value of *r* itself. Thus, $V_r = \frac{(1-r^2)^2}{(n-1)}$, where V_r is the variance of *r* and *n* is the sample size. In this formula, any biased estimation of *r* may affect the variance estimation. Hence, the variance of the Z-transform is desirable and is given as $V_{zr} = \frac{1}{(n-3)}$, where V_{zr} is the variance of the Z-transform and *n* is the sample size. See Lipsey and Wilson (2001) and Ringquist (2013).

(mandatory or voluntary), choice of measure, control variables, estimation method, and strength of the reported results.

Mode of adoption

We considered the mode of adoption as mandatory or voluntary adoption. Studies on mandatory adoption are different from those on voluntary adoption in terms of sample size, sample period, reporting incentives, and countries with different institutional settings. Mandatory adoption is mostly characterised by larger sample sizes than voluntary adoption. In terms of the sample period, voluntary adoption is not as clustered in time as mandatory adoption. Voluntary adoption is spread over a period from 1990 to 2005 while most mandatory adoption occurred in the year 2005, predominantly in EU countries. There is therefore substantial variation in the timing of voluntary adoption across countries compared with mandatory adoption. The clustering of mandatory adoption around 2005 makes it difficult to isolate institutional changes and other confounding events. Also, voluntary adoption is open to both private and public firms whereas mandatory adoption is predominantly for public firms. However, voluntary adoption samples suffer from self-selection. In our sample, 66% of the primary regressions relate to mandatory adoption.

Choices of measure

Variation in the choice of measure[4] employed is likely to be a key determinant of the variation in the reported results of the adoption of IFRS (Stanley and Jarrell, 1989). We identified 47 different measures of the effect of adoption of IFRS on comparability (16), liquidity (21), cost of equity (6), and cost of debt (4).

Control variables

A range of control variables were used in the regressions reported in the primary studies. Based on their similarities, we identified 4 firm-specific control variables (size, leverage, market-to-book, performance). Because most of the primary studies examine an international setting, we identify regressions that control for the institutional setting (level of enforcement).

Estimation methods

The studies use a variety of estimation methods for the effect of adoption of IFRS, including firm fixed effects, year fixed effects, industry fixed effects, country fixed effects, OLS, DID, 2SLS, and PSM.

[4] See Appendix for the description of the choices of measure.

Strength of results

There are several additional factors that may impact the IFRS adoption effect. These factors are indications of the strength of the regression results reported in the studies included in our meta-analysis. We identify the factors listed below as other potential sources of heterogeneity.

Endogeneity

Endogeneity is a major concern, especially in studies on voluntary adoption. In studies on voluntary adoption, there is increased likelihood of self-selection bias. We thus include an indicator variable for studies that control for endogeneity.

Publication status

There are debates in the meta-analysis literature as to whether unpublished papers should be included or not. Habib (2012) excludes unpublished papers because such papers have not been subjected to final review processes and may subsequently be published with different results. However, other studies (Rosenthal, 1979; Duval and Tweedie, 2000; Scargle, 2000; Pomeroy and Thornton, 2008; Wang and Shailer, 2015, 2018) argue that publication of a research paper could be a function of editors and reviewers giving priority to novel, interesting and significant results (even with some empirical flaws). Thus, studies introducing novel ideas are more likely to survive the review process than replication studies and studies using the same variables as previous studies. Including only published papers ensure quality (Hay *et al*., 2006), but to mitigate the biases associated with journal publication, we include both published and unpublished results and test whether publication status has a significant impact on the effect size estimates.

Journal quality

We include a dummy variable to control for the relative quality of the primary studies as indicated by journal ranking. Top-ranked journals give an indication of the quality and rigour in published studies. Using the ABDC ranking, our meta-analysis includes 43 studies that have high-quality ratings and 13 studies (including unpublished papers) that have low-quality ratings.

Robust standard error

We include an indicator variable for studies that estimate regressions using robust standard errors. Robust standard errors ensure that test statistics used in estimating the effect sizes are not overstated. About 82% of the reported regressions included robust standard errors.

Year of publication

We examine whether the year in which studies are published has any relationship with the reported results. It is more likely for studies on IFRS to be published in later years as more data becomes available and more researchers develop an interest in this research area.

Sample size

Larger sample sizes are likely to produce a higher test statistic and thus produce a higher effect size estimate. The sample size in our analysis ranges from 26 to 613,752 firm-year observations. This variation is largely the result of some studies examining only a single country while others cover multiple countries or the result of the duration of the sample period used.

Sample period

Longer sample periods are more likely to capture the phenomenon being tested as opposed to shorter sample periods. The sample period in our analysis ranges from 1-16 years with most studies using a four-year sample period.

META-REGRESSION MODEL

To test our hypotheses H_{1b}, H_{2b}, H_{3b} and H_{4b}, we use the random effect model applied in Ringquist (2013). The random effects model accounts for excess heterogeneity in addition to sampling error. If the excess heterogeneity is not accounted for, the standard errors of the regression coefficient would be underestimated resulting in an overstatement of the significance of the sources of heterogeneity (Thompson and Sharp, 1999).

Our random effect meta-regression model used to examine the effect of the variability in the effect size estimates is given by:

$$Z_r = \beta_0 + \beta_1 \mathrm{AD} + \beta_2 \mathrm{MC} + \beta_3 CV + \beta_4 \mathrm{EM} + \beta_5 \mathrm{SR} + \mu, \mu \sim N(0, \nu_\iota + \tau^2) \quad (1)$$

where, Z_r is the Fisher's transformed effect size estimates of adoption of IFRS for, in turn, financial reporting comparability, market liquidity, cost of equity, and cost of debt, calculated from the regression results reported in the sample studies; *AD* is a dummy variable for mode of adoption, whether mandatory adoption or voluntary adoption; *MC* is a column vector of dummy variables for different measures, in turn, for comparability (16 measures), market liquidity (21 measures), cost of equity (6 measures), and cost of debt (4 measures); *CV* is a column vector of dummy variables for the selected control variables (*size*, *leverage*, *market-to-book*, *performance*, and *level of enforcement*) used in the regression models of the primary studies; *EM* is a column vector of dummy variables representing the estimation methods (*firm*

fixed effects, year fixed effects, industry fixed effects, country fixed effects, OLS, *DID, 2SLS,* and *PSM*) used in the regressions reported in the sample studies; *SR* is a column vector of dummy variables which influence strength of results (*endogeneity, publication status, journal quality, robust standard error, year of publication, sample size,* and *sample period*); and β_2 to β_5 are row vectors of coefficients on the study characteristics. The v_i is the within-study variance and τ^2 is the between-study variance. The variables are defined in Table 5.

(insert Table 5 about here)

We use the approach proposed by Knapp and Hartung (2003) to adjust the standard errors of the parameters of our meta-regression to derive an unbiased estimator of the variance. The τ^2 is estimated using restricted maximum likelihood as suggested by Thompson and Sharp (1999).

RESULTS AND ANALYSIS

Distribution of effect size results by primary studies

Table 6 reports the distribution of effect size results for each of the primary studies and summaries of the effect size results for financial reporting comparability, market liquidity, cost of equity, and cost of debt. In Panel A of Table 6, the studies are listed in alphabetical order of the lead author for each dimension. Cascino and Gassen (2015) reported the highest number of effect sizes for financial reporting comparability (41), Daske *et al*. (2008) reported the highest number of effect sizes for market liquidity (87), Kim *et al*. (2014) reported the highest number of effect sizes for cost of equity (91), and Florou and Kosi (2015) reported the highest number of effect sizes for cost of debt (68). Bailey *et al*. (2006) and Leuz and Verrecchia (2000) provided only one effect size.

For financial reporting comparability, Callao *et al*. (2007) reported the largest mean effect size (mean ES = 0.236, $p < 0.001$) and Kvaal and Nobes (2010) reported the smallest mean effect size (mean ES = -0.276, $p < 0.001$); for market liquidity, Beneish *et al*. (2015) reported the largest mean effect size (mean ES = 0.305, $p < 0.001$) and Bailey *et al*. (2006) reported the smallest mean effect size (mean ES = -0.041, $p < 0.1$); for the cost of equity, Houqe *et al*. (2016) reported the largest mean effect size (mean ES = 0.182, $p < 0.001$) and Karamanou amd Nishiotis (2009) reported the smallest mean effect size (mean ES = -0.166, $p < 0.01$); and for cost of debt, Kim *et al*. (2011) reported the largest mean effect size (mean ES = 0.051, $p < 0.001$) and Chen *et al*. (2015) reported the smallest mean effect size (mean ES = -0.020, $p < 0.001$).

Analysis of Panel A of Table 6 shows that for financial reporting comparability Lang and Stice-Lawrence (2015) reported the largest significant impact. For market liquidity, Drake *et al*. (2010) reported the largest significant impact and Kim *et al*. (2014) reported the largest significant impact on cost of equity. The nonsignificant results for cost of debt is a result of the significant negative mean effect from Chen *et al*. (2015) offsetting with the other positive results.

Panel B of Table 6 shows a mean effect size of 0.025 ($p < 0.001$) for financial reporting comparability, 0.008 ($p < 0.001$) for market liquidity, 0.013 ($p < 0.001$) for cost of equity, and 0.004 ($p > 0.10$) for cost of debt. The results indicate that, overall, adoption of IFRS increases financial reporting comparability, market liquidity and decreases cost of equity, but the impact on cost of debt is not significant.

(insert Table 6 about here)

We investigate the 'file drawer' problem by calculating the fail-safe number. The fail-safe number is the number of studies that would be required to overturn a conclusion drawn from a significant relationship between dependent and independent variables. The studies in focus are those that have been conducted but not reported or could not be published due to selective publication bias against studies that fail to report significant results. We follow Rosenthal (1979) in calculating the fail-safe number.

The results reported in Table 6 are robust to 'file drawer' publication bias. The fail-safe number is approximately 12,389 for comparability, 17,215 for market liquidity and 644 for cost of equity. This suggests that publication bias can be ruled out as the fail-safe numbers significantly exceed the reasonable tolerance level.[5] The fail-safe value for cost of debt is not computed as the mean effect size is not significant.

Distribution of effect size by country and by sample period

The distribution of the effect size results by country and by sample period is shown in Table 7 Panel A and Panel B respectively. Panel A of Table 7 shows the distribution of effect sizes across sample countries which include 9 single countries. There are 16 (29%) out of 56 studies that cover the 9 single countries. This gives an indication of high concentration on multiple countries and thus limited evidence on specific countries, particularly on non-European and

[5] The reasonable tolerance level is the estimated number of studies (critical value) likely to cause the 'file drawer' problem and is compared to the fail-safe number to draw a conclusion on possible publication bias. If the fail-safe number is greater than the critical value, publication bias can be ruled out. The reasonable tolerance level is calculated as $Y = (5 \times k) + 10$, where k is the number of studies (Rosenthal, 1979). The reasonable tolerance level is 120 studies for comparability, 145 studies for market liquidity and 55 studies for cost of equity.

developing countries. The highest number of effect sizes for a single country is 60 for Germany and the lowest number is for Italy with just two effect sizes. The smallest mean effect size was reported for Canada. The is likely a result of Canada adopting IFRS in a later year (in 2011) relative to the other countries in the sample. Spain reported the largest mean effect size. This result is consistent with prior literature reporting a larger impact of adoption of IFRS for countries that experienced a larger accounting change in accounting standards following adoption of IFRS (Bae *et al*. 2008; Hong *et al*., 2014).

Panel B reports the distribution of effect size results by the sample periods used in the primary studies. This represents the number of years in each primary study sample period. We expect that studies that use longer sample periods are better able to capture the phenomenon being tested. Using the median sample period, the majority of the primary studies used sample periods from 1 to 8 years. Thus, 38 out of 56 studies which is approximately 70% of the total sample studies. The sample periods 1 to 8 also produced 946 out of 1265 effect sizes which is approximately 75% of the total sample studies. The sample period 4 produced the highest number of studies (9) and the sample period 8 produced the highest number of effect sizes (276).

(insert Table 7 about here)

Distribution of effect size results by journal quality and other sources of heterogeneity

Table 8 shows the distribution of effect sizes by sources of heterogeneity. To show the impact of journal quality, the table shows both total results and separate results for studies published in high-quality journals. A high-quality journal is defined as a journal with A^* or A ranking according to the ABDC journal ranking. Overall, 1,036 out of 1,265 (=82%) of the results are from papers published in high-quality journals. However, note that for cost of equity less than half of the effect sizes were from studies published in high-quality journals whereas all the results for cost of debt were from high-quality journals. Of the total results, 585 (= 46%) show a significant positive effect and 477 (= 38%) report a non-significant effect. The significant positive effects occurred in 46 studies, and the non-significant effects in 42 studies.

With regards to the mode of adoption, 839 out of the total of 1,265 results (= 66%) were on mandatory adoption and 426 (= 34%) relate to voluntary adoption. For the choice of measure, studies that used uniformity in financial reporting reported the highest number of effect size for financial reporting comparability (93 out of 324 = 29%); studies that used equity ownership reported the highest number of effect size for market liquidity (133 out of 647 = 21%); studies that used price-earnings-growth reported the highest number of effect size for cost of equity

(81 out of 186 = 44%); and studies that used loan spread reported the highest number of effect size for cost of debt (65 out of 108 = 60%). Among the control variables, most of the studies included size (977 out of 994 = 98%) and performance (783 out 994 = 79%) as firm-level controls.

For estimation methods, most of the effect sizes included firm fixed effects (987 out of 1,265 = 78%). For studies that were based on other fixed effects, 482 (= 49%) included year fixed effects, 859 (= 87%) included industry fixed effects, and 585 (= 59%) included country fixed effects. OLS regression was the most common estimation method (1,158 out of 1,265 = 92%) and PSM is the least frequently used method in estimation (14 out of 1,265 = 1%).

With regards to the strength of the results, the table shows that most of the studies controlled for endogeneity (1,139 out of 1,265 = 90%). The sample is made up of 1,191 (= 94%) effect sizes from published studies, 1,036 (= 82%) effect sizes from studies published in high-quality journals, and 1,046 (= 82%) effect sizes from studies that included robust standard errors.

(insert Table 8 about here)

Distribution of effect size results by mode of adoption and other sources of heterogeneity

Table 9 reports on effect sizes by mode of adoption of IFRS and other sources of heterogeneity. There are 41 studies that report on mandatory adoption, 8 studies report on voluntary adoption, and 7 studies reported on both mandatory and voluntary adoption. Mandatory adoption produces an overall mean effect size of 0.031 ($z = 7.30$, $p < 0.001$) and voluntary adoption a mean effect size of 0.022 ($z = 5.02$, $p < 0.001$). These results indicate that, overall, both mandatory and voluntary adoption have an impact on financial reporting comparability, market liquidity, cost of equity, and cost of debt.

Comparability under mandatory adoption shows an overall significant positive mean effect size of 0.039 ($z = 4.27$, $p < 0.001$). This result indicates that mandatory adoption had a positive impact on financial reporting comparability. The result is driven by the higher significant positive impact of accruals-cash flows (mean ES = 0.080, $z = 40.55$, $p < 0.001$) and change in investment (mean ES = 0.027, $z = 36.60$, $p < 0.001$) but offset by the significant negative impact of uniformity in accounting policies (mean ES = -0.286, $z = -18.38$, $p < 0.001$). Comparison of the mean effect size for the measure for mandatory adoption shows that returns-equity reported the largest mean effect size (mean ES = 0.157, $z = 7.75$, $p < 0.001$). All the measures for comparability under mandatory adoption are significant and positive other than earnings-book values and uniformity in accounting policies.

For voluntary adoption, there are only 13 effect sizes, but the mean effect size is positive and significant (mean ES = 0.090, $z = 5.30$, $p < 0.001$). This indicates that voluntary adoption had a positive impact on financial reporting comparability. Only three choices of measure were identified for studies on voluntary adoption. This is possibly due to relatively small number of studies on voluntary adoption for comparability and these studies measured comparability as comparable earnings forecast, returns on peers, and returns-earnings. The results for the measures for voluntary adoption show that returns-earnings had the largest impact on comparability.

The measures for market liquidity show an overall positive and significant mean effect size for both mandatory (mean ES = 0.029, $z = 7.60$, $p < 0.001$) and voluntary adoption (mean ES = 0.009, $z = 3.60$, $p < 0.001$). This indicates that both mandatory and voluntary adoption had a positive impact on market liquidity. The result for mandatory adoption shows that the mean effect size for the measures for mandatory adoption is driven in part by the significant positive impact of access to the debt market (mean ES = 0.026, $z = 9.77$, $p < 0.001$). Access to the debt market is, however, negative and significant for voluntary adoption and thus reduces the positive impact reported for most of the measures for voluntary adoption. All the choices of measure for market liquidity under mandatory adoption are positive and significant other than bid-ask spread, change in domestic ownership, change in foreign ownership, institutional ownership, net cash flows, price impact, and trading cost. The lower positive impact for voluntary adoption compared to mandatory adoption is a result of the significant negative impact reported for access to the debt market.

For cost of equity, mandatory adoption shows a positive and significant mean effect of 0.041 ($z = 2.61$, $p < 0.01$). The result for mandatory adoption is driven by price-earnings-growth and WACC. Voluntary adoption shows an overall positive and significant mean effect of 0.024 ($z = 2.05$, $p < 0.05$). All the measures of cost of equity for voluntary adoption report a positive and significant effect size except for implied cost of equity which is negative and significant (mean ES = -0.062, $z = -2.67$, $p < 0.001$) and risk premium which is negative but not significant (mean ES = -0.011, $z = -0.24$, $p = 0.810$). This indicates an adverse impact of voluntary adoption on cost of equity if cost of equity is measured by implied cost of equity. The adverse impact from the implied cost of equity and risk premium is counteracted by the higher positive and significant mean effect from the other choices of measure for voluntary adoption.

As noted above, Panel B of Table 6, the overall effect for cost of debt is not significant. However, this reflects the nonsignificant results for mandatory adoption swamping the significant result for voluntary adoption. Furthermore, analysis of the choice of measures

shows that the nonsignificant overall effect for mandatory adoption for cost of debt is because of the competing results for loan spread which is negative and significant (mean ES = -0.022, z = -5.02, $p < 0.001$) whereas yield on bonds is positive and significant (mean ES = 0.031, z = 5.90, $p < 0.001$). Also, implied cost of debt and interest-debt ratio are both not significant. For voluntary adoption, the overall mean effect size for the choices of measure is positive and significant (mean ES = 0.022, z = 4.17, $p < 0.001$). The loan spread for voluntary adoption is positive and significant (mean ES = 0.035, z = 4.85, $p < 0.001$) in contrast to the loan spread for mandatory adoption. Yield on bonds is not significant for voluntary adoption. The loan spread drives the results for the choices of measure for cost of debt under voluntary adoption.

Overall, the control variables are highly significant for mandatory adopters (mean ES = 0.034, z = 11.62, $p < 0.001$) but not significant for voluntary adopters (mean ES = 0.003, z = 1.47, p = 0.142). The control variables thus show a stronger positive and significant effect for mandatory adoption than voluntary adoption. All the control variables for mandatory adoption are highly significant at $p < 0.001$. For voluntary adoption, size and market-to-book are not significant.

The estimation methods show that most of the effect sizes were calculated from regressions using OLS and including fixed effects. All the estimation methods for mandatory adoption show a positive significant effect except for 2SLS. The results for voluntary adoption show that studies that used year fixed effects, DID, and 2SLS produce a positive effect for voluntary adoption of IFRS.

All the measures for strength of results are positive and significant for mandatory adoption. For voluntary adoption, all the measures for strength of results are positive and significant except for publication status which is positive but not significant (mean ES = 0.002, z = 0.50, p = 0.617) and journal quality which is negative and significant (mean ES = -0.010, z = -1.72, $p < 0.1$).

(insert Table 9 about here)

Meta-regression results

We examine the various sources of heterogeneity using the random effect model, Equation (1). The model is estimated for each of comparability, liquidity, cost of equity, and cost of debt. In each case, the set of dummy variables representing the choice of measures used is such that each observation scores on exactly one of the dummies and therefore estimation of the model runs into the problem of perfect multicollinearity. The usual approach to estimation is then to exclude one of the dummy variables with the result that the coefficients obtained on the

included dummy variables show the impact of those variables relative to the impact of the excluded variable. However, the results differ depending on which variable is excluded and therefore the results are difficult to interpret. Hence, we adopted the approach introduced in Suits (1984) which provides coefficients for all the dummy variables and these indicate the effect of each variable relative to the mean effect of the set of variables. The meta-regression results are reported in Tables 10 to 13.

Comparability

The R-squared reported in Table 10 shows that the variables explain 82% of the heterogeneity. The result shows that the difference between the impact of mandatory adoption and voluntary adoption on comparability is not statistically significant. Among the choice of measures, accruals-cash flows (coefficient = 0.082, $p = 0.020$), change in investment (coefficient = 0.046, $p = 0.073$), compliance (coefficient = 0.069, $p = 0.011$), and forecast accuracy (coefficient = 0.050, $p = 0.011$) all have a positive and significant impact on effect size relative to the mean impact of choice of measure. However, returns on peers (coefficient = -0.085, $p = 0.062$) and uniformity in accounting policies (coefficient = 0.082, $p = 0.067$) have a negative and significant impact on effect size. The other measures do not have a significant impact.

For the control variables, only market-to-book has a positive and significant impact on effect size (coefficient = 0.050, $p = 0.067$). For estimation methods, the significant and positive coefficients for year fixed effects (coefficient = 0.126, $p = 0.001$) and industry fixed effects (coefficient = 0.047, $p = 0.001$) indicate that where included, these effects had a positive impact on effect size. The significant negative coefficients for country fixed effects (coefficient = -0.061, $p < 0.001$) indicate that where included, these effects had a negative impact on effect size.

The results show that endogeneity (coefficient = 0.076, $p = 0.097$), publication status (coefficient = 0.092, $p = 0.033$) and robust standard errors (coefficient = 1.530, $p < 0.001$) showed a positive and significant impact on effect size.

(insert Table 10 about here)

Market liquidity

In Table 11, the R-squared reported shows that the variables explain 55% of the heterogeneity. The results show that compared to voluntary adoption, mandatory adoption leads to a stronger impact on effect size (coefficient = 0.019, $p < 0.001$). Among the choice of measures, debt investment (coefficient = 0.294, $p < 0.001$), equity investment (coefficient = 0.098, $p = 0.005$), and total investment (coefficient = 0.329, $p < 0.001$) all have a positive and significant impact

on effect size relative to the mean impact of choice of measure. However, access to the debt market (coefficient = -0.034, $p < 0.001$), bid-ask spread (coefficient = -0.049, $p < 0.001$), change in domestic ownership (coefficient = -0.050, $p = 0.023$), change in foreign ownership (coefficient = -0.031, $p < 0.001$), equity ownership (coefficient = -0.018, $p = 0.003$), institutional ownership (coefficient = -0.037, $p = 0.001$), liquidity factor (coefficient = -0.043, $p < 0.001$), loan size (coefficient = -0.036, $p < 0.001$), net cash flows (coefficient = -0.059, $p < 0.001$), number of lenders (coefficient = -0.028, $p = 0.001$), price impact (coefficient = -0.040, $p < 0.001$), trading volume (coefficient = -0.136, $p < 0.001$), turnover ratio (coefficient = -0.044, $p < 0.001$), and zero returns (coefficient = -0.033, $p < 0.001$) have a negative and significant impact on effect size. The other measures do not have a significant impact.

For the control variables, the coefficient on performance (coefficient = 0.015, $p < 0.008$) is positive and significant while the coefficient on market-to-book (coefficient = -0.025, $p = 0.007$) is negative and significant. These results indicate that in the studies that included performance, this control variable had a positive impact on effect size while the market-to-book, where included, had a negative impact on effect size. For estimation methods, only firm fixed effects had a significant coefficient (coefficient = -0.045, $p < 0.001$) and thus, where included, these effects had a negative impact on effect size.

The results show the inclusion of robust standard errors (coefficient = 1.137, $p < 0.001$) and duration of the sample periods (coefficient = 0.002, $p < 0.001$) had a positive and significant impact on effect size while year of publication (coefficient = -0.002, $p = 0.001$) had a negative impact on effect size.

(insert Table 11 about here)

Cost of equity

The R-squared reported in Table 12 shows that the variables explain 66% of the heterogeneity. The results show that the difference between mandatory and voluntary adoption on cost of equity is only marginally significant (coefficient = 0.033, $p = 0.088$). Among the choice of measures, none of the coefficients is significant and thus none of the measures has a significant impact on effect size relative to the mean impact of choice of measure.

For the control variables, only the coefficients on leverage (coefficient = 0.052, $p = 0.026$) and performance (coefficient = -0.276, $p < 0.001$) are significant. The significant positive coefficient on leverage indicates that, where included, leverage had a positive impact on effect size while the significant negative coefficient on performance indicates that, where included, it had a negative impact on effect size.

The significant positive coefficients on year fixed effects (coefficient = 0.354, $p < 0.001$) and DID (coefficient = 0.171, $p = 0.001$) show that, where employed, these methods had a positive impact on effect size while the significant negative coefficient on firm fixed effects (coefficient = -0.273, $p = 0.065$), where employed, had a negative impact on effect size.

The significant positive coefficient on year of publication (coefficient = 0.041, $p < 0.001$) indicates that recent publication had a positive impact on effect size while the significant negative coefficient on sample period (coefficient = -0.006, $p = 0.011$) indicates that longer sample periods had a negative impact on effect size.

(insert Table 12 about here)

Cost of debt

The R-squared reported in Table 13 shows that the variables explain 54% of the heterogeneity. The results show that the difference between the impact of mandatory adoption and voluntary adoption on cost of debt is significant (coefficient = 0.011, $p = 0.078$). Among the choice of measures, none of the coefficients is significant and thus none of the measures has a significant impact on effect size relative to the mean impact of choice of measure.

The coefficients on the control variables and estimation methods are all not significant. This indicates that the type control variables and estimation methods do not have a significant impact on effect size.

For the strength of results, the coefficients on robust standard errors (coefficient = 1.903, $p = 0.033$) and sample size (coefficient = 0.016, $p = 0.019$) were positive and significant. This indicates that the use of robust standard errors and larger sample size had a positive impact on effect size. The negative and significant coefficient on year of publication (coefficient = -0.025, $p = 0.096$) shows that recency of publication had a negative impact on effect size.

(insert Table 13 about here)

CONCLUSION

This study examines the impact of adoption of IFRS on financial reporting comparability, market liquidity, and cost of capital. Overall, adoption of IFRS significantly improves comparability, increases market liquidity, and reduces the cost of equity, but has no significant effect on cost of debt. Mandatory adoption of IFRS had a greater impact than voluntary adoption. However, for cost of debt, voluntary adoption resulted in a reduction in the cost of debt but the impact of mandatory adoption on cost of debt was not significant. The significant

impact of voluntary adoption on cost of debt is a result of the significant positive impact for loan spread.

Our results reveal the positive impact for all the control variables for both mandatory and voluntary adoption other than the inclusion of size and market-to-book for voluntary adoption. The estimation methods showed positive impact for mandatory adoption other than 2SLS, while for voluntary adoption, only year fixed effect, DID, and 2SLS had a significant positive effect across the dimensions of IFRS adoption.

For comparability, the meta-regression results show that the impact of mandatory adoption does not differ significantly from voluntary adoption. The results show that for the choice of measure, accruals-cash flows, change in investment, compliance, forecast accuracy, returns on peers, and uniformity in accounting policies are significant in explaining the variation in the reported empirical studies. Only market-to-book as a control variable provides a significant impact. All the estimation methods contribute to the explanation of the variation in the reported empirical results except firm fixed effect and DID. Among the factors affecting the strength of the results, endogeneity, publication status and use of robust standard errors explain the variation in the reported results.

For market liquidity, the meta-regression results show that the impact of mandatory adoption is significantly different from voluntary adoption and all the choices of measure have significant impact on effect size relative to the mean impact of choice of measure except for foreign investment, fund ownership, proceeds from foreign markets, and trading cost. Only market-to-book and performance as control variables and only firm fixed effects as an estimation method are important in explaining the variation in the reported results. Robust standard errors, year of publication, and duration of sample period are significant indicators of the strength of results.

For cost of equity, the meta-regression results show that the impact of mandatory adoption is significantly different from voluntary adoption but among the choice of measures, none of the measures has a significant impact on effect size relative to the mean impact of choice of measure. For the control variables, leverage and performance and for estimation methods, firm fixed effects, year fixed effects, and DID all contribute to explanation of the variation in effect size. Year of publication and duration of sample period contribute to explanation of the variation in effect size.

For cost of debt, the meta-regression results show that the impact of mandatory adoption is significantly different from voluntary adoption but among the choice of measures, as with cost of equity, none of the measures has a significant impact on effect size relative to the mean

impact of choice of measure. Similarly, among the estimation methods, none have a significant impact. However, robust standard errors, year of publication, and sample size do contribute to variation in effect size across the studies.

In summary, the findings from the meta-regression in this study indicate that the mixed results in empirical studies are principally due to the mode of adoption, differences in choice of measures, control variables, the estimation methods, and measures indicating the strength of the results.

We note that a high proportion of our sample studies examined multiple countries, addressed cost of equity and had focused on relatively short sample periods. We thus suggest that future research should provide additional evidence on single countries to enable decisions to be made based on the evidence unique to a particular country setting. Furthermore, given the importance of the cost of debt further study on the impact of IFRS on cost of debt is warranted.

Few of the studies used more recent data sets on adoption of IFRS. The majority of the studies in our sample may, therefore, have reached conclusions on evidence that is now outdated. We, therefore, suggest the need for additional studies using recent data on adoption of IFRS as a number of the standards have gone through significant revision and new standards have also been introduced. Additionally, future research might investigate the role of corporate governance and audit quality in IFRS implementation.

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Table 1: Summary of studies included in the meta-analysis (number of countries in parentheses)

Author	Year	Journal	Country	Adoption	Sample period	Sample size	Source of information
Alexandre & Clavier	2017	QREF	Multiple (15)	Mandatory	2002-2008	3,748	Table 4
Bailey, Karolyi & Salva	2006	JFE	Multiple (40)	Voluntary	1989-2001	1,814	Table 7
Bartov, Goldberg & Kimm	2005	UP	Germany	Voluntary	1991-2000	915	Tables 4, 5, 6, 7 & 8
Beneish, Miller & Yohn	2015	JAPP	Multiple (47)	Mandatory	2003-2007	188	Tables 3 & 4
Brochet, Jagolinzer & Riedl	2013	CAR	UK	Mandatory	2003-2006	2,616	Tables 3, 4, 5 & 6
Callao, Jarne & Lainez	2007	JIAAT	Spain	Mandatory	2004-2005	26	Tables 6 & 8
Cascino & Gassen	2015	RAS	Multiple (29)	Mandatory	2001-2008	16,418	Tables 2, 5, 6, 7 & 8
Chen, Chin, Wang & Yao	2015	JIAR	Multiple (31)	Mandatory	2000-2011	25,290	Tables 3, 4, 5 & 6
Chen, Young & Zhuang	2013	AR	Multiple (17)	Mandatory	2000-2009	4,429	Table 5
Christensen, Hail & Leuz	2013	JAE	Multiple (56)	Mandatory/voluntary	2001-2009	613,752	Tables 3, 4, 5 & 6
Covring, DeFond & Hung	2007	JAR	Multiple (29)	Voluntary	1998-2002	24,592	Tables 4, 5, 6 & 7
Dargenidou, McLeay & Raonic	2006	AB	Multiple (10)	Voluntary	1995-2003	1,294	Tables 3 & 4
Dargenidou & McLeay	2010	EAR	Multiple (14)	Mandatory/voluntary	2000-2006	2,033	Tables 3 & 4
Daske	2006	JBFA	Germany	Voluntary	1993-2002	24,359	Tables 7 & 9
Daske, Hail, Leuz & Verdi	2008	JAR	Multiple (51)	Mandatory/voluntary	2001-2005	105,527	Tables 4, 5, 7 & 8
Daske, Hail, Leuz & Verdi	2013	JAR	Multiple (30)	Mandatory/voluntary	1990-2005	68,076	Tables 3, 6, 7 & 8
DeFond, Hu, Hung & Li	2011	JAE	Multiple (24)	Mandatory	2003-2007	35,980	Tables 5 & 6
DeFond, Hu, Hung & Li	2012	JIAR	Multiple (15)	Mandatory	2003-2007	18,956	Tables 4, 5, 7, 8, 9 & 10
Drake, Myers & Yao	2010	UP	Multiple (22)	Mandatory	1993-2007	351,287	Tables 3 & 4
Florou & Kosi	2015	RAS	Multiple (20)	Mandatory/voluntary	2000-2007	13,546	Tables 4, 5, 6 & 7
Florou & Pope	2012	AR	Multiple (45)	Mandatory/voluntary	2003-2006	85,741	Tables 6, 7, 8, 9 & 10
Franzen & Weißenberger	2018	JIAAT	Germany	Mandatory	2007-2010	654	Table 10
Glaum, Schmidt, Street & Vogel	2013	ABR	Multiple (17)	Mandatory	2005	357	Tables 5, 6 & 7
Gordon, Loeb & Zhu	2012	JAPP	Multiple (208)	Mandatory	1996-2008	1,343	Tables 5, 7, A, B & C
Haller & Wehrfritz	2013	JIAAT	Multiple (2)	Mandatory	2005-2009	811	Table 6
Hamberg, Mavruk & Sjögren	2013	JIMF	Sweden	Mandatory	2001-2007	1,737	Tables 3, 4, 5 & 6
Hong, Hung & Lobo	2014	AR	Multiple (31)	Mandatory	2003-2007	5,260	Tables 5, 6 & 7
Horton, Serafeim & Serafeim	2013	CAR	Multiple (46)	Mandatory	2001-2007	20,564	Tables 6 & 7
Houqe, Monem & van Zijl	2016	JIAAT	New Zealand	Mandatory	1998-2013	290	Tables 5 & 6
Jones & Finley	2011	BAR	Multiple (22)	Mandatory	1994-2006	81,560	Table 5

Table 1 *continued*

Author(s)	Year	Journal	Country	Adoption	Sample period	Sample size	Source of information
Karamanou & Nishiotis	2009	JBFA	Multiple (8)	Voluntary	1998-2002	59	Table 9
Khan	2016	UP	Multiple (3)	Mandatory	2006-2013	41,171	Tables 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 & 16
Kim, Shi & Zhou	2014	RQFA	Multiple (34)	Voluntary	1998-2004	21,608	Tables 4 & 5
Kim, Tsui & Yi	2011	RAS	Multiple (40)	Voluntary	1997-2005	2,083	Tables 4, 5 & 7
Kvaal & Nobes	2010	ABR	Multiple (4)	Mandatory	2005-2006	172	Table 3
Lang & Stice-Lawrence	2015	JAE	Multiple (42)	Mandatory	1998-2011	80,003	Tables 4, 6, 7 & 9
Lang, Maffett & Owens	2010	UP	Multiple (47)	Mandatory	1998-2008	5,233	Tables 7& 8
Lepone & Wong	2018	JBFA	Australia	Mandatory	2005-2006	18,476	Tables 5 & 8
Leuz & Verrecchia	2000	JAR	Germany	Mandatory	1998	102	Table 4
Li	2010	AR	Multiple (18)	Mandatory	1995-2006	6,456	Tables 4 & 6
Liao, Sellhorn & Skaife	2012	JIAR	France	Mandatory	2004-2006	783	Tables 5 & 7
Lin, Riccardi & Wang	2017	UP	Germany	Mandatory	2002-2010	1,307	Tables 5, 6 & 7
Moscariello, Skerratt & Pizzo	2014	ABR	Multiple (2)	Mandatory	2002-2008	1,006	Tables 3 & 4
Muller, Riedl & Sellhorn	2011	MS	Multiple (14)	Mandatory	2004-2008	431	Table 4
Neel	2017	CAR	Multiple (23)	Mandatory	2001-2008	14,888	Tables 6 & 8
Panaretou, Shackleton & Taylor	2013	CAR	UK	Mandatory	2003-2008	972	Table 11
Paugam & Ramond	2015	JBFA	France	Mandatory	2006-2009	445	Tables 4, 5, 6 & 8
Persakis & Iatridis	2017	JIFMIM	Multiple (19)	Mandatory	2000-2014	202,425	Table 7
Petaibanlue, Walker & Lee	2015	IRFA	Multiple (14)	Mandatory	2004-2006	975	Table 4
Platikanova & Perramon	2012	SJFA	Multiple (4)	Mandatory	2005-2011	3,007	Table 3
Sundgren, Mäki & Samoza-López	2018	IJA	Multiple (11)	Mandatory	2009-2014	289	Table 6
Tan, Wang & Welker	2011	JAR	Multiple (25)	Mandatory	1998-2007	1,938	Tables 5 & 7
Wang	2014	JAR	Multiple (47)	Mandatory	2001-2008	26,349	Tables 3, 4, 5 & 6
Wu & Zhang	2010	UP	Multiple (15)	Mandatory	1993-2008	12,049	Tables 4, 5, 6 & 7
Yip & Young	2012	AR	Multiple (17)	Mandatory/voluntary	2002-2007	1,654	Tables 2, 3, 4 & 5
Yu & Wahid	2014	AR	Multiple (46)	Mandatory	2003-2007	56,060	Tables 5, 6, 7 & 8

Notes: This table reports summary of the studies included in the meta-analysis. It shows the author(s) and year of publication, the journal of publication, the sample country or countries, whether the study examined mandatory and/or voluntary adoption, the sample period, the sample size, and where the statistic is picked from. Studies that examined more than one country is indicated 'multiple' with the number of countries in parentheses.

Table 2: Journal articles and journal quality rankings included in the meta-analysis

Abbrev.	Journal	No. of hits	No. of studies	ABDC ranking	ABS ranking
AR	The Accounting Review	31	6	A*	4*
JAE	Journal of Accounting and Economics	21	3	A*	4*
JAR	Journal of Accounting Research	30	6	A*	4*
CAR	Contemporary Accounting Research	17	4	A*	4
RAS	Review of Accounting Studies	15	3	A*	4
JFE	Journal of Financial Economics	1	1	A*	4*
MS	Management Science	1	1	A*	4*
EAR	European Accounting Review	17	1	A*	3
AB	Abacus	5	1	A	4
JIFMIM	Journal of International Financial Markets, Institutions & Money	3	1	A	3
ABR	Accounting and Business Research	23	3	A	3
JBFA	Journal of Business Finance & Accounting	21	4	A	3
JAPP	Journal of Accounting and Public Policy	10	2	A	3
BAR	British Accounting Review	9	1	A	3
IRFA	International Review of Financial Analysis	11	1	A	3
IJA	The International Journal of Accounting	16	1	A	3
JIMF	Journal of International Money & Finance	1	1	A	3
JIAR	Journal of International Accounting Research	17	3	A	2
JIAAT	Journal of International Accounting, Auditing and Taxation	5	4	B	3
RQFA	Review of Quantitative Finance and Accounting	1	1	B	3
QREF	The Quarterly Review of Economics and Finance	1	1	B	2
SJFA	Spanish Journal of Finance and Accounting	3	1	NA	1
UP	Unpublished papers		6	NA	NA

Notes: This table reports the journal rankings for the studies included in the meta-analysis. It shows the full name of the journal abbreviations indicated in Table 1. The number of hits indicates the number of papers identified per journal in the search process. The table also shows the number of studies included in the sample per journal and the ranking of the journal by the ABDC and ABS journal ranking. For ABDC ranking, journals with 'A^*' and 'A' are considered high-quality journals, and for ABS, journal ranking '4^*', '4', and '3' are considered high-quality journals. NA indicates that the journal is not ranked. Total number of studies is 56.

Table 3: Description of formulas for the meta-analysis assuming fixed effect model

Name of formula	Calculation	Description
Effect size using correlation	$ES_r = r$	ES represents effect size and r is the product-moment correlation coefficient.
Effect size using t-statistic	$ES_r = \sqrt{\frac{t^2}{(t^2 + df)}}$	*t* is t-statistic and *df* is the degrees of freedom given by *n-1* where n is the sample size.
Effect size using z-statistic	$ES_r = \sqrt{\frac{Z^2}{N}}$	*Z* is *z*-statistic and *N* is the total sample size.
Z-transform effect size	$Z_r = 0.5log_e\left[\frac{1 + ES_r}{1 - ES_r}\right]$	ES_{z_r} is z-transformed effect size.
Standard error	$SE_{z_r} = \frac{1}{\sqrt{n_i - 3}}$	SE_{z_r} is standard error for each calculated effect size and $n_i$is the sample size for each study.
Inverse variance	$w_i = \frac{1}{SE^2{}_{z_r}}$	w_i is the weight given to the sample size of each study.
Weighted mean effect size	$\overline{ES} = \frac{\sum(w_i ES_i)}{\sum w_i}$	$\overline{ES}$ is the mean effect size calculated for all effect sizes in the meta-analysis. This is the main statistic of interest to capture the aggregate effect of the test variable on the dependent variable.
Standard error of the mean	$SE_{\overline{ES}} = \frac{1}{\sqrt{\Sigma w_i}}$	$SE_{\overline{ES}}$ this is the standard error of the mean computed as the square root of the sum of the inverse variance weights

Table 4: Description of formulas for the meta-analysis assuming random effects model

Name of formula	Calculation	Description
Chi-square statistic	$Q = \Sigma w_i(ES_i - \overline{ES})^2$	This is for the homogeneity test based on the Q statistic, which is distributed as a chi-square with k-1 degrees of freedom where k is the number of effect sizes in the study.
Tau squared	$\tau^2 = \frac{Q - df}{\sum w_i - \frac{\sum w_i^2}{\sum w_i}}$	This is an estimate of the between-study variance. *Q* is the *Q*-statistic and *df* is the degrees of freedom.
Weight	$w_i^* = \frac{1}{v_1^*}$	This is the weight assigned to each study where v_i^* is total variance for each study.
Total variance	$v_i^* = v_i + \tau^2$	The total variance includes the within-study variance for study *i* plus the between-studies variance, tau-squared.
Weighted mean effect size	$\overline{ES}^* = \frac{\sum(w_i^* ES_i)}{\sum w_i^*}$	$\overline{ES}^*$ is the mean effect size calculated assuming a random effect model.
Variance of mean effect size	$v^* = \frac{1}{\sum w_i^*}$	This is the reciprocal of the sum of the weights.
Standard error of mean effect size	$SE_{\overline{ES}^*} = \sqrt{v^*}$	$SE_{\overline{ES}^*}$ is the standard error of mean effect size computed as the square root of the variance of mean effect size.
Lower limit	$\overline{ES}_l^* = \overline{ES}^* - 1.96(SE_{\overline{ES}^*})$	$\overline{ES}_l^*$ is the lower limit given by subtracting the product of the critical z-value and the desired confidence interval from the mean effect size.
Upper limit	$\overline{ES}_u^* = \overline{ES}^* + 1.96(SE_{\overline{ES}^*})$	$\overline{ES}_u^*$ is the upper limit given by adding the product of the critical z-value and the desired confidence interval to the mean effect size.
z-statistic	$Z^* = \frac{\lvert\overline{ES}^*\rvert}{SE_{\overline{ES}^*}}$	This tests the significance of the mean effect size. $\lvert\overline{ES}^*\rvert$ is the absolute value of the mean effect size and $SE_{\overline{ES}^*}$ is the standard error of the mean effect size.
Fail-safe number	$X = (k/2.706)[k(Z^*)^2 - 2.706]$	This calculates the number of studies that would make significant results become insignificant. *k* is the number of studies and Z^* is the z-statistic.

Table 5: Variable definitions

Variable	Definition
Dependent variable	
Z_r	Effect size reported in the primary studies measuring the relationship between IFRS adoption and financial reporting comparability, market liquidity and cost of capital. The effect size is based on Fisher's z-transformation of the partial correlation coefficient (*r*).
Test variables	
Mode of adoption:	
Mandatory/voluntary	Dummy is 1 if the study examined mandatory adoption and 0 for voluntary adoption
Choices of measure	
Comparability:	
Accruals-cash flows	Dummy is 1 if the effect size estimate is based on an accrual-cash flows model
Change in investment	Dummy is 1 if the effect size estimate is based on a measure of change in investment
Comparable earnings forecast	Dummy is 1 if the effect size estimate is based on a measure of comparable earnings forecast
Comparable industry-firm	Dummy is 1 if the effect size estimate is based on a measure of comparable industry
Compliance	Dummy is 1 if the effect size estimate is based on a measure compliance with reporting standards
Earnings-book values	Dummy is 1 if the effect size estimate is based on measure earnings-book values
Earnings-cash flows	Dummy is 1 if the effect size estimate is based on measure earnings-cash flows similarities
Forecast accuracy	Dummy is 1 if the effect size estimate is based on measure of forecast accuracy
Investment efficiency	Dummy is 1 if the effect size estimate is based on a measure of investment efficiency
Returns for insiders	Dummy is 1 if the effect size estimate is based on a measure of returns to insiders trading
Returns on peers	Dummy is 1 if the effect size estimate is based on a measure of returns of firm peers
Returns-earnings	Dummy is 1 if the effect size estimate is based on return-earnings synchronism
Returns-equity	Dummy is 1 if the effect size estimate is based on a measure of returns-equity
Similarities in ratios	Dummy is 1 if the effect size estimate is based on a measure of the similarities in ratios
Uniformity in accounting policies	Dummy is 1 if the effect size estimate is based on a measure of uniformity in accounting policies
Uniformity in financial reporting	Dummy is 1 if the effect size estimate is based on a measure of uniformity in financial reporting

Table 5 *continued*

Variable	Definition
Market liquidity:	
Access to debt market	Dummy is 1 if the effect size estimate is based on a measure of ease in accessing debt
Bid-ask spread	Dummy is 1 if the effect size estimate is based on the bid-ask spread
Change in domestic ownership	Dummy is 1 if the effect size estimate is based on changes in domestic ownership
Change in foreign ownership	Dummy is 1 if the effect size estimate is based on changes in foreign ownership
Debt investment	Dummy is 1 if the effect size estimate is based on debt investment in firms
Equity investment	Dummy is 1 if the effect size estimate is based on equity investment in firms
Equity ownership	Dummy is 1 if the effect size estimate is based on equity ownership in firms
Foreign investment	Dummy is 1 if the effect size estimate is based on the investment in firms by foreign investors
Fund ownership	Dummy is 1 if the effect size estimate is based on a fund in ownership
Institutional ownership	Dummy is 1 if the effect size estimate is based on institutional ownership in firms
Liquidity factor	Dummy is 1 if the effect size estimate is based on liquidity factor
Loan size	Dummy is 1 if the effect size estimate is based on the size of loans of firms
Net cash flows	Dummy is 1 if the effect size estimate is based on the net cash flows from investment
Number of lenders	Dummy is 1 if the effect size estimate is based on number of lenders
Price impact	Dummy is 1 if the effect size estimate is based on price impact of trading
Proceeds from investment	Dummy is 1 if the effect size estimate is based on the proceeds received from foreign investors
Total investment	Dummy is 1 if the effect size estimate is based on the total investment in firms
Trading cost	Dummy is 1 if the effect size estimate is based on trading cost
Trading volume	Dummy is 1 if the effect size estimate is based on trading volume
Turnover ratio	Dummy is 1 if the effect size estimate is based on turnover ratio
Zero returns	Dummy is 1 if the effect size estimate is based on the number of trades with zero returns
Cost of equity:	
Abnormal earnings	Dummy is 1 if the effect size estimate is based on abnormal earnings growth model
Implied cost of equity	Dummy is 1 if the effect size estimate is based on the implied cost of equity model
Price-earnings-growth	Dummy is 1 if the effect size estimate is based on the price-earnings-growth model
Residual income	Dummy is 1 if the effect size estimate is based on the residual income valuation model
Risk premium	Dummy is 1 if the effect size estimate is based on the risk premium model
WACC	Dummy is 1 if the effect size estimate is based on the weighted average cost of capital

Table 5 *continued*

Variable	Definition
Cost of debt:	
Implied cost of debt	Dummy is 1 if the effect size estimate is based on the implied cost of debt model
Interest-debt ratio	Dummy is 1 if the effect size estimate is based on interest to debt ratio
Loan spread	Dummy is 1 if the effect size estimate is based on loan spread
Yield on bonds	Dummy is 1 if the effect size estimate is based on yield on bonds
Control variables:	
Size	Dummy is 1 if the primary study included a control variable for size of a firm
Leverage	Dummy is 1 if the primary study included a control variable for leverage of a firm
Market-to-book	Dummy is 1 if the primary study included a control variable for market-to-book ratio of a firm
Performance	Dummy is 1 if the primary study included a control variable for firm performance
Level of enforcement	Dummy is 1 if the primary study included a control variable level of enforcement
Estimation methods:	
Firm fixed effects	Dummy is 1 if the primary study regression model uses firm fixed effect method
Year fixed effects	Dummy is 1 if the primary study controlled for year
Industry fixed effects	Dummy is 1 if the primary study controlled for industry
Country fixed effects	Dummy is 1 if the primary study controlled for country
OLS	Dummy is 1 if the primary study regression model uses OLS estimation
DID	Dummy is 1 if the primary study regression model uses difference-in-difference
2SLS	Dummy is 1 if the primary study regression model uses 2SLS
PSM	Dummy is 1 if the primary study regression model uses propensity score matching
Strength of results:	
Endogeneity	Dummy is 1 if the primary study regression model controls for endogeneity
Publication status	Dummy is 1 if the study is published in a refereed journal
Journal quality	Dummy is 1 if the study is published in a high-quality journal
Robust standard errors	Dummy is 1 if the effect size estimate is based on a regression model with robust standard errors
Year of publication	Year an article is published or written (for unpublished papers)
Sample size	Log of sample size of the effect size estimate
Sample period	Number of years in the sample window

Table 6: Distribution of effect size results by primary studies

Authors	No. of ES	Min	Max	Mean	SE	*z*-stats
Panel A						
Comparability						
Bartov, Goldberg & Kimm (2005)	8	0.026	0.190	0.113	0.015	7.76
Brochet, Jagolinzer & Riedl (2013)	24	0.041	0.244	0.098	0.006	16.52
Callao, Jarne & Lainez (2007)	17	-0.816	0.811	0.236	0.050	4.77
Cascino & Gassen (2015)	41	-0.070	0.062	0.005	0.001	3.70
Chen, Young & Zhuang (2013)	6	0.005	0.028	0.020	0.006	3.26
Dargenidou & McLeay (2010)	8	0.010	0.111	0.028	0.010	2.62
DeFond, Hu, Hung & Li (2011)	6	-0.008	0.033	0.012	0.006	2.19
Glaum, Schmidt, Street & Vogel (2013)	13	0.004	0.188	0.095	0.016	6.08
Haller & Wehrfritz (2013)	9	-0.074	0.207	0.027	0.014	1.96
Horton, Serafeim & Serafeim (2013)	20	-0.018	0.048	0.003	0.002	1.97
Jones & Finley (2011)	9	0.012	0.040	0.024	0.001	20.47
Kvaal & Nobes (2010)	16	-0.417	-0.162	-0.276	0.019	-14.63
Lang & Stice-Lawrence (2015)	10	0.058	0.159	0.080	0.001	57.06
Lang, Maffett & Owens (2010)	4	-0.137	-0.049	-0.098	0.008	-12.40
Liao, Sellhorn & Skaife (2012)	12	-0.186	0.054	-0.007	0.011	-0.65
Lin, Riccardi & Wang (2017)	9	-0.048	0.084	0.029	0.012	2.53
Neel (2017)	14	0.001	0.614	0.026	0.002	10.26
Petaibanlue, Walker & Lee (2015)	15	-0.019	0.106	0.055	0.010	5.37
Tan, Wang & Welker (2011)	26	-0.037	0.092	0.014	0.003	5.43
Wang (2014)	21	-0.012	0.025	0.012	0.002	6.92
Wu & Zhang (2010)	12	-0.033	0.036	0.002	0.003	0.57
Yip & Young (2012)	24	-0.027	0.375	0.085	0.011	8.01
Market liquidity						
Alexandre & Clavier (2017)	36	-0.125	0.086	0.001	0.004	0.22
Bailey, Karolyi & Salva (2006)	1	-0.041	-0.041	-0.041	0.024	-1.73
Beneish, Miller & Yohn (2015)	15	-0.028	0.619	0.305	0.021	14.24
Christensen, Hail & Leuz (2013)	44	-0.002	0.008	0.001	0.000	2.56
Covring, DeFond & Hung (2007)	26	0.001	0.032	0.012	0.001	9.25
Daske, Hail, Leuz & Verdi (2008)	87	-0.046	0.190	0.008	0.001	15.58
Daske, Hail, Leuz & Verdi (2013)	39	-0.071	0.015	-0.005	0.001	-7.02
DeFond, Hu, Hung & Li (2011)	11	-0.045	0.025	0.018	0.002	8.17
DeFond, Hu, Hung & Li (2012)	21	0.001	0.033	0.023	0.002	12.68
Drake, Myers & Yao (2010)	25	0.001	0.040	0.013	0.000	36.44
Florou & Kosi (2015)	78	-0.040	0.068	0.005	0.001	4.21
Florou & Pope (2012)	58	-0.022	0.285	0.014	0.001	17.12
Franzen & Weibenberger (2018)	4	-0.061	0.030	-0.013	0.020	-0.66
Gordon, Loeb & Zhu (2012)	13	-0.004	0.187	0.077	0.011	7.33
Hamberg, Mävruk & Sjógren (2013)	28	-0.145	0.160	0.066	0.006	11.17
Hong, Hung & Lobo (2014)	14	-0.029	0.298	0.050	0.006	8.56
Khan (2016)	24	-0.074	0.047	0.001	0.001	0.78
Kim, Tsui & Yi (2011)	36	-0.037	0.111	0.035	0.003	11.47
Lang & Stice-Lawrence (2015)	15	-0.034	0.055	0.011	0.002	6.50
Lepone & Wong (2018)	6	0.015	0.050	0.030	0.004	7.53
Leuz & Verrecchia (2000)	1	0.212	0.212	0.212	0.103	2.07
Muller, Riedl & Sellhorn (2011)	3	0.086	0.172	0.130	0.031	4.14
Neel (2017)	36	-0.086	0.023	-0.025	0.001	-17.49
Panaretou, Shackleton & Taylor (2013)	2	-0.024	-0.024	-0.024	0.023	-1.05
Platikanova & Perramon (2012)	3	0.031	0.073	0.058	0.011	5.44
Sundgren, Maki & Samoza-Lopez (2018)	8	0.038	0.100	0.082	0.021	3.81
Yu & Wahid (2014)	13	0.002	0.064	0.017	0.002	6.98

Table 6 *continued*

Authors	No. of ES	Min	Max	Mean	SE	*z*-stats
Cost of equity						
Dargenidou, Mcleay & Raonic (2006)	6	-0.162	0.133	-0.011	0.046	-0.24
Daske (2006)	32	-0.835	0.163	-0.023	0.002	-10.98
Daske, Hail, Leuz & Verdi (2008)	9	-0.045	0.021	0.000	0.003	0.10
Daske, Hail, Leuz & Verdi (2013)	12	-0.051	-0.004	-0.019	0.002	-8.53
Houqe, Monem & van Zijl (2016)	4	0.157	0.230	0.182	0.027	6.78
Karamanou & Nishiotis (2009)	7	-0.353	-0.006	-0.166	0.057	-2.91
Kim, Shi & Zhou (2014)	91	-0.009	0.086	0.032	0.001	37.82
Li (2010)	8	-0.132	0.051	-0.077	0.005	-16.81
Paugam & Ramond (2015)	15	0.008	0.135	0.088	0.012	7.04
Persakis & Latridis (2017)	2	0.005	0.006	0.005	0.002	2.31
Cost of debt						
Chen, Chin, Wang & Yao (2015)	20	-0.075	0.042	-0.020	0.002	-9.73
Florou & Kosi (2015)	68	-0.063	0.091	0.004	0.002	2.70
Kim, Tsui & Yi (2011)	15	0.028	0.134	0.051	0.006	8.75
Moscariello, Skerratt & Pizzo (2014)	4	-0.022	0.027	0.006	0.023	0.28
Persakis & Latridis (2017)	1	0.012	0.012	0.012	0.004	3.29

Summary of effect size results

Summary	No. of ES	Min	Max	Mean	SE	*z*-stats
Panel B						
Comparability	324	-0.816	0.811	0.025	0.003	8.33
Market liquidity	647	-0.145	0.619	0.008	0.001	8.00
Cost of equity	186	-0.835	0.230	0.013	0.003	4.49
Cost of debt	108	-0.075	0.134	0.004	0.003	1.33

*Note*s: This table shows, in Panel A, distribution of effect sizes for each study included in the meta-analysis. No. of ES represents the number of effects sizes estimated from each studies regression estimates. ES = effect size as calculated by the Fisher's *z* transform effect size. SE = standard error. Panel B reports the summary of the studies under comparability, market liquidity, cost of equity and cost of debt. The total number of studies for the meta-analysis is 56 and the total number of effect sizes estimated is 1,265.

Table 7: Panel A: Distribution of effect size results by country

Country	No. of studies	No. of ES	Min	Max	Mean ES	SE	*z*-value
Australia	1	10	-0.005	0.050	0.018	0.006	3.03
Canada	1	16	-0.006	0.047	0.008	0.003	2.37
France	3	21	-0.186	0.135	0.058	0.017	3.43
Germany	5	60	-0.163	0.835	0.092	0.026	3.51
Italy	1	2	0.020	0.027	0.024	0.004	6.71
New Zealand	1	4	0.157	0.230	0.185	0.016	11.49
Spain	1	17	-0.816	0.811	0.268	0.115	2.32
Sweden	1	24	-0.065	0.160	0.065	0.013	5.01
UK	2	36	-0.145	0.244	0.064	0.012	5.35
Multiple	40	1075	-0.417	0.619	0.018	0.002	9.00

Panel B: Distribution of effect size results by sample period

Sample period	No. of studies	No. of ES	Min	Max	Mean ES	SE	*z*-value
1	4	35	-0.816	0.811	0.175	0.058	3.03
2	4	54	-0.417	0.207	-0.059	0.022	-2.64
3	1	6	0.026	0.190	0.111	0.027	4.19
4	9	227	-0.074	0.619	0.050	0.007	7.51
5	4	119	-0.353	0.190	0.007	0.006	1.25
6	4	42	-0.027	0.375	0.094	0.012	7.64
7	7	187	-0.145	0.160	0.025	0.003	7.55
8	5	276	-0.086	0.614	0.007	0.003	1.96
9	3	101	-0.162	0.134	0.021	0.004	4.91
10	3	70	-0.163	0.835	0.088	0.022	3.95
11	1	4	-0.137	-0.049	-0.092	0.018	-5.16
12	3	36	-0.132	0.042	-0.025	0.008	-3.13
13	2	14	-0.041	0.187	0.068	0.014	4.74
14	1	25	-0.034	0.159	0.040	0.010	4.19
15	2	23	0.001	0.040	0.014	0.002	6.38
16	3	46	-0.033	0.170	0.001	0.004	0.20

*Note*s: This table shows a distribution of effect sizes by country in Panel A and by sample period in Panel B. In Panel A, No. of studies represents the number of individual papers that used a single country sample or multiple countries in their sample. In Panel B, the No. of studies represent studies that used a particular number of sample period. No. of ES represents the number of effect sizes. ES = effect size as calculated by the Fisher's z transform effect size. SE = standard error. The total number of studies for the meta-analysis is 56 and the total number of effect sizes estimated is 1,265.

Table 8: Distribution of effect size results by journal quality and by other sources of heterogeneity

	Number of ES		Number of significant results					
			Positive		Negative		Not significant	
Classification	All	HQJ	All	HQJ	All	HQJ	All	HQJ
Overall	1,265	1,036	585	455	203	183	477	398
Mode of adoption:								
Mandatory adoption	839	709	415	356	118	98	306	255
Voluntary adoption	426	327	170	99	85	85	171	143
Choices of measure								
Comparability:	324	282	161	142	45	35	118	105
Accruals-cash flows	3	0	3	0	0	0	0	0
Change in investment	4	4	4	4	0	0	0	0
Comp. earnings forecast	8	8	3	3	0	0	5	5
Comp. industry-firm	6	6	1	1	0	0	5	5
Compliance	13	13	8	8	0	0	5	5
Earnings-book values	12	12	0	0	3	3	9	9
Earnings-cash flows	42	42	18	18	5	5	19	19
Forecast accuracy	20	20	11	11	6	6	3	3
Investment efficiency	2	2	0	0	0	0	2	2
Returns for insiders	14	14	14	14	0	0	11	11
Returns on peers	21	21	10	10	0	0	19	13
Returns-earnings	55	37	30	22	6	2	4	4
Returns-equity	6	6	2	2	0	0	0	0
Similarities in ratios	9	9	9	9	0	0	0	0
Uniformity in accounting policies	16	16	0	0	16	16	0	0
Uniformity in financial reports	93	72	48	40	9	3	36	29
Market liquidity:	647	555	300	258	88	78	259	219
Access to the debt market	78	78	37	37	25	25	16	16
Bid-ask spread	89	67	22	16	19	17	48	34
Change in domestic ownership	1	1	0	0	0	0	1	1
Change in foreign ownership	10	10	7	7	0	0	3	3
Debt investment	6	6	5	5	0	0	1	1
Equity investment	6	6	3	3	0	0	3	3
Equity ownership	133	133	72	72	8	8	53	53
Foreign investment	13	13	8	8	0	0	5	5
Fund ownership	13	13	12	12	0	0	1	1
Institutional ownership	5	5	2	2	0	0	3	3
Liquidity factor	61	55	28	22	4	4	29	29
Loan size	13	13	7	7	0	0	6	6
Net cash flows	36	0	10	0	8	0	18	0
Number of lenders	23	23	12	12	0	0	11	11
Price impact	40	40	5	5	14	14	21	21
Proceeds from investment	14	14	12	12	0	0	2	2
Total investment	3	3	3	3	0	0	0	0
Trading cost	41	41	14	14	8	8	19	19
Trading volume	1	1	0	0	1	1	0	0
Turnover ratio	15	0	13	0	0	0	2	0
Zero returns	46	33	28	21	1	1	17	11

Table 8 *continued*

	Number of ES		Number of significant results					
			Positive		Negative		Not significant	
Classification	All	HQJ	All	HQJ	All	HQJ	All	HQJ
Cost of equity:	186	91	90	21	47	47	49	23
Abnormal earnings	24	17	8	1	11	11	5	5
Implied cost of equity	50	50	16	16	21	21	13	13
Price-earnings-growth	81	2	58	2	0	0	23	0
Residual income	23	16	4	0	13	13	6	3
Risk premium	6	6	2	2	2	2	2	2
WACC	2	0	2	0	0	0	0	0
Cost of debt:	108	108	34	34	23	23	51	51
Implied cost of debt	1	1	1	1	0	0	0	0
Interest-debt ratio	4	4	0	0	0	0	4	4
Loan spread	65	65	18	18	21	21	26	26
Yield on bonds	38	38	15	15	2	2	21	21
Control variables:	994	864	452	390	164	147	378	329
Size	977	851	441	378	165	148	371	325
Leverage	529	501	238	222	100	97	191	182
Market-to-book	617	556	296	253	110	103	211	200
Performance	783	687	355	303	111	100	317	284
Level of enforcement	366	244	194	122	35	27	137	95
Estimation methods:								
Firm fixed effects	987	863	429	367	170	153	388	343
Year fixed effects	482	398	220	172	75	64	187	162
Industry fixed effects	859	782	374	329	150	145	335	308
Country fixed effects	585	533	224	209	112	97	249	227
OLS	1,158	1,013	510	439	201	181	447	393
DID	751	629	351	296	102	85	298	248
2SLS	93	9	63	4	2	2	20	3
PSM	14	14	12	12	0	0	2	2
Strength of results:								
Endogeneity	1,139	926	524	403	171	154	444	369
Publication status	1,191	1,036	546	455	194	183	451	398
Journal quality	1,265	1,036	585	455	203	183	477	398
Robust standard errors	1,042	904	480	385	164	157	398	362
Year of publication	1,265	1,036	585	455	203	183	477	398
Sample size	1,265	1,036	585	455	203	183	477	398
Sample period	1,265	1,036	585	455	203	183	477	398

Notes: This table shows a classification of the attributes in the studies included in the meta-analysis. It shows the total number of effects sizes estimated per each attribute, the number of positive and negative significant effect size estimates and non-significant effect size estimates from the meta-analysis. Effect sizes estimated from publications in high-quality journals are reported under the column represented by HQJ (high-quality journals). The total number of studies for the meta-analysis is 56 and the total number of effect sizes estimated is 1,265.

Table 9: Distribution of effect size results by mode of adoption and other sources of heterogeneity

	Mandatory				Voluntary			
Classification	No. of ES	Mean ES	SE	*z*-stats	No. of ES	Mean ES	SE	*z*-stats
Overall	839	0.031	0.004	7.30	426	0.022	0.004	5.02
Choices of measure								
Comparability	311	0.039	0.009	4.27	13	0.090	0.017	5.30
Accruals-cash flows	3	0.080	0.002	40.55				
Change in investment	4	0.027	0.001	36.60				
Comparable earnings forecast	4	0.022	0.006	3.47	4	0.075	0.022	3.37
Comparable industry-firm	6	0.012	0.006	2.17				
Compliance	13	0.096	0.019	4.92				
Earnings-book values	12	-0.009	0.020	-0.43				
Earnings-cash flows	42	0.008	0.005	1.59				
Forecast accuracy	20	0.007	0.004	1.52				
Investment efficiency	2	0.007	0.001	5.42				
Returns for insiders	14	0.097	0.008	11.59				
Returns on peers	20	0.012	0.002	6.85	1	-0.012	0.000	0.00
Returns-earnings	47	0.057	0.014	4.05	8	0.110	0.021	5.25
Returns-equity	6	0.157	0.020	7.75				
Similarities in ratios	9	0.024	0.003	7.10				
Uniformity in accounting policies	16	-0.286	0.016	-18.38				
Uniformity in financial reports	93	0.098	0.024	4.05				
Market liquidity:	432	0.029	0.004	7.60	215	0.009	0.002	3.60
Access to the debt mkt	45	0.026	0.003	9.77	33	-0.022	0.002	-8.89
Bid-ask spread	76	0.007	0.006	1.07	13	-0.004	0.003	-1.09
Change in domestic ownership	1	0.009	0.000	0.00				
Change in foreign ownership	10	0.011	0.007	1.63				
Debt investment	6	0.383	0.102	3.75				
Equity investment	6	0.185	0.064	2.92				
Equity ownership	77	0.033	0.005	6.30	56	0.021	0.007	2.97
Foreign investment	13	0.077	0.013	6.05				
Fund ownership	13	0.029	0.005	6.05				
Institutional ownership	5	0.010	0.005	1.82				

Table 9 *continued*

	Mandatory				Voluntary			
Classification	No. of ES	Mean ES	SE	*z*-stats	No. of ES	Mean ES	SE	*z*-stats
Market liquidity:								
Liquidity factor	39	0.008	0.003	3.02	22	0.005	0.002	2.25
Loan size					13	0.025	0.007	3.79
Net cash flows	36	-0.002	0.010	-0.15				
Number of lenders					23	0.036	0.007	5.60
Price impact	20	0.008	0.011	0.76	20	-0.004	0.002	-2.25
Proceeds from investment	14	0.067	0.020	3.34				
Total investment	3	0.407	0.089	4.56				
Trading cost	24	-0.009	0.009	-0.99	17	0.008	0.002	4.05
Trading volume					1	-0.041	0.000	0.00
Turnover ratio	15	0.016	0.003	6.11				
Zero returns	29	0.029	0.007	4.13	17	0.010	0.002	4.64
Cost of equity:	35	0.041	0.016	2.61	151	0.024	0.012	2.05
Abnormal earnings	1	0.101	0.000	0.00	23	0.075	0.039	1.89
Implied cost of equity	28	0.014	0.015	0.92	22	-0.062	0.023	-2.67
Price-earnings-growth	4	0.153	0.032	4.80	77	0.029	0.002	11.70
Residual income					23	0.118	0.055	2.16
Risk premium					6	-0.011	0.046	-0.24
WACC	2	0.170	0.013	13.01				
Cost of debt:	61	-0.001	0.005	-0.30	47	0.022	0.005	4.17
Implied cost of debt	1	0.012	0.000	0.00				
Interest-debt ratio	4	0.008	0.011	0.71				
Loan spread	35	-0.022	0.004	-5.02	30	0.035	0.007	4.85
Yield on bonds	21	0.031	0.005	5.90	17	0.000	0.003	-0.05
Control variables:	723	0.034	0.003	11.62	271	0.003	0.002	1.47
Size	711	0.027	0.002	12.63	266	0.003	0.002	1.41
Leverage	371	0.018	0.002	7.80	158	0.005	0.002	2.31
Market-to-book	449	0.027	0.002	11.56	168	0.002	0.002	1.12
Performance	539	0.024	0.002	12.18	244	0.005	0.002	2.34
Level of enforcement	222	0.032	0.005	6.18	144	0.030	0.003	8.75

Table 9 *continued*

	Mandatory				Voluntary			
Classification	No. of ES	Mean ES	SE	*z*-stats	No. of ES	Mean ES	SE	*z*-stats
Estimation methods:								
Firm fixed effects	721	0.028	0.003	10.28	266	0.002	0.002	1.10
Year fixed effects	287	0.023	0.003	8.20	195	0.004	0.002	1.85
Industry fixed effects	598	0.023	0.002	10.62	261	0.001	0.002	0.72
Country fixed effects	410	0.022	0.004	5.35	175	0.002	0.003	0.50
OLS	816	0.031	0.004	7.47	342	-0.007	0.006	-1.17
DID	529	0.026	0.003	7.84	222	0.010	0.004	2.46
2SLS	9	0.029	0.025	1.20	84	0.030	0.002	12.11
PSM	14	0.067	0.020	3.34				
Strength of results:								
Endogeneity	740	0.029	0.003	10.76	399	0.010	0.002	5.00
Publication status	765	0.033	0.004	7.69	426	0.002	0.004	0.50
Journal quality	709	0.034	0.005	7.43	327	-0.010	0.006	-1.72
Robust standard errors	665	0.025	0.002	10.51	377	0.011	0.002	5.50
Year of publication	839	0.031	0.004	7.30	426	0.022	0.004	5.50
Sample size	839	0.031	0.004	7.30	426	0.022	0.004	5.50
Sample period	839	0.031	0.004	7.30	426	0.022	0.004	5.50

Notes: The table shows results of independent variables, separate for mandatory adoption and voluntary adoption. It reports the number of effect size estimated, the mean effect size per each attribute, the standard error, and the *z*-statistic. The total number of studies for the meta-analysis is 56 and the total number of effect sizes estimated is 1,265.

Table 10: Meta-regression results for comparability

Variable	Coefficient	*p*-value
Heterogeneity sources		
Mandatory/voluntary	0.026	0.258
Choices of measure		
Accruals-cash flows	0.082	0.020
Change in investment	0.046	0.073
Comparable earnings forecasts	0.023	0.500
Comparable industry-firm	-0.029	0.262
Compliance	0.069	0.011
Earnings-book values	0.000	0.995
Earnings-cash flows	0.023	0.241
Forecast accuracy	0.050	0.011
Investment efficiency	0.026	0.374
Returns for insiders	0.017	0.446
Returns on peers	-0.085	0.062
Returns-earnings	0.023	0.168
Returns-equity	0.039	0.444
Similarities in ratios	0.076	0.103
Uniformity in accounting policies	-0.349	0.000
Uniformity in financial reporting	-0.011	0.593
Control variables		
Size	-0.024	0.112
Leverage	-0.004	0.896
Market-to-book	0.050	0.067
Performance	-0.029	0.189
Level of enforcement	-0.003	0.664
Estimation methods		
Firm fixed effects	-0.069	0.125
Year fixed effects	0.126	0.001
Industry fixed effects	0.047	0.001
Country fixed effects	-0.061	0.000
DID	0.004	0.705
Strength of results		
Endogeneity	0.076	0.097
Publication status	0.092	0.033
Journal quality	-0.021	0.593
Robust standard errors	1.530	0.000
Year of publication	0.001	0.824
Sample size	0.004	0.349
Sample period	-0.002	0.576
Constant	-1.677	0.816
Number of effect sizes	324	
tau-squared (τ^2)	0.0007	
R-squared (R^2)	0.82	

Notes: The table reports regression analysis of sources of heterogeneity in the effect sizes for comparability. The dependent variable is Z_r. Variables are defined in the variable definition table.

Table 11: Meta-regression results for market liquidity

Variable	Coefficient	*p*-value
Heterogeneity sources		
Mandatory/voluntary	0.019	0.000
Choices of measure		
Access to debt market	-0.034	0.000
Bid-ask spread	-0.049	0.000
Change in domestic ownership	-0.05	0.023
Change in foreign ownership	-0.031	0.000
Debt investment	0.294	0.000
Equity investment	0.098	0.005
Equity ownership	-0.018	0.003
Foreign investment	-0.016	0.275
Fund ownership	-0.013	0.121
Institutional ownership	-0.037	0.001
Liquidity factor	-0.043	0.000
Loan size	-0.036	0.000
Net cash flows	-0.059	0.000
Number of lenders	-0.028	0.001
Price impact	-0.04	0.000
Proceeds from investment	-0.009	0.672
Total investment	0.329	0.000
Trading cost	-0.046	0.350
Trading volume	-0.136	0.000
Turnover ratio	-0.044	0.000
Zero returns	-0.033	0.000
Control variables		
Size	0.017	0.113
Leverage	0.017	0.112
Market-to-book	-0.025	0.007
Performance	0.015	0.008
Level of enforcement	-0.004	0.865
Estimation methods		
Firm fixed effects	-0.045	0.000
Year fixed effects	-0.004	0.934
Industry fixed effects	0.006	0.271
Country fixed effects	-0.005	0.206
DID	0.004	0.249
2SLS	-0.011	0.365
PSM	-0.007	0.967
Strength of results		
Endogeneity	-0.018	0.818
Publication status	-0.009	0.572
Journal quality	-0.033	0.806
Robust standard errors	1.137	0.000
Year of publication	-0.002	0.001
Sample size	0.000	0.890
Sample period	0.002	0.000
Constant	4.765	0.001
Number of effect sizes	647	
tau-squared (τ^2)	0.0003	
R-squared (R^2)	0.55	

Notes: The table reports regression analysis of sources of heterogeneity in the effect sizes for market liquidity. The dependent variable is Z_r. Variables are defined in the variable definition table.

Table 12: Meta-regression results for cost of equity

Variable	Coefficient	*p*-value
Heterogeneity sources		
Mandatory/voluntary	-0.033	0.088
Choices of measure		
Abnormal earnings	0.036	0.322
Implied cost of equity	-0.012	0.664
Price-earnings-growth	0.019	0.897
Residual income	0.021	0.980
Risk premium	0.063	0.397
WACC	0.039	0.235
Control variables		
Size	-0.003	0.934
Leverage	0.052	0.026
Market-to-book	0.095	0.179
Performance	-0.276	0.000
Level of enforcement	0.005	0.500
Estimation methods		
Firm fixed effects	-0.273	0.065
Year fixed effects	0.354	0.000
Industry fixed effects	0.055	0.491
Country fixed effects	0.084	0.350
DID	0.171	0.001
Strength of results		
Endogeneity	-0.006	0.615
Journal quality	0.057	0.116
Year of publication	0.041	0.000
Sample size	0.005	0.121
Sample period	-0.006	0.011
Constant	-82.778	0.000
Number of effect sizes	186	
tau-squared (τ^2)	0.0007	
R-squared (R^2)	0.66	

Notes: The table reports regression analysis of sources of heterogeneity in the effect sizes for cost of equity. The dependent variable is Z_r. Variables are defined in the variable definition table.

Table 13: Meta-regression results for cost of debt

Variable	Coefficient	*p*-value
Heterogeneity sources		
Mandatory/voluntary	0.011	0.078
Choices of measure		
Implied cost of debt	-0.009	0.949
Interest-debt ratio	-0.005	0.853
Loan spread	-0.005	0.501
Yield on bonds	0.018	0.782
Control variables		
Size	0.060	0.696
Leverage	0.021	0.563
Market-to-book	-0.021	0.691
Performance	0.060	0.163
Level of enforcement	-0.002	0.782
Estimation methods		
Firm fixed effects	0.008	0.784
Year fixed effects	-0.012	0.792
Industry fixed effects	-0.127	0.250
Country fixed effects	0.021	0.528
DID	0.018	0.817
Strength of results		
Endogeneity	0.015	0.797
Journal quality	-0.002	0.966
Robust standard errors	1.903	0.033
Year of publication	-0.025	0.096
Sample size	0.016	0.019
Sample period	-0.002	0.822
Constant	50.242	0.095
Number of effect sizes	108	
tau-squared (τ^2)	0.0004	
R-squared (R^2)	0.54	

Notes: The table reports regression analysis of sources of heterogeneity in the effect sizes for cost of debt. The dependent variable is Z_r. Variables are defined in the variable definition table.

Appendix: Description of choices of measure

Choices of measure	Description
Comparability:	
Accruals-cash flow	The relationship association between accruals and cash flows.
Change in investment	Change in capital and R&D expenditure driven by the ROA of a firm and its peers.
Comparable earnings forecast	Comparable earnings forecasts of firms across countries.
Comparable industry-firm	Industry-peer firms using the same accounting standards.
Compliance	Compliance across companies and countries.
Earnings-book values	Relationship between earnings and book value of equity.
Earnings-cash flow	The association between earnings and cash flows.
Forecast accuracy	Increase in forecast accuracy driving by improved information environment.
Investment efficiency	Comparing under- and over-investment between firms and their foreign peers.
Returns for insiders	Decrease in insiders' information advantage due to comparable firms and peers.
Returns on peers	Comparing market reactions between announcing firms and peer non-announcing firms.
Returns-earnings	Association between returns and earnings.
Returns-equity	Association between returns and book value of equity.
Similarities in ratios	Similarities of accounting ratios between firms across countries.
Uniformity in accounting policies	Uniformity in accounting policies between countries.
Uniformity in financial reporting	Uniformity in reported figures of firms and their peers.
Market liquidity:	
Access to debt market	Propensity to access public debt market than private debt market.
Bid-ask spread	The difference between the bid and ask price.
Change in domestic ownership	Change in domestic ownership by mutual funds.
Change in foreign ownership	Change in foreign mutual fund ownership in the US relative to the EU.
Debt investment	Increases in foreign debt investment.
Equity investment	Increases in foreign equity investment.
Equity ownership	Increases in equity shareholdings.
Foreign investment	Foreign investment relative to total equity market capitalisation.
Fund ownership	Changes in fund ownership driven by asset allocation decisions.
Institutional ownership	Change in firms' institutional holdings.
Liquidity factor	Aggregate of bid-ask spread, price impact, trading cost, and zero returns.
Loan size	The amount of loans banks are willing to extend.
Net cash flow	Net cash flows lent by banks
Number of lenders	The total number of loan lenders.
Price impact	Daily absolute stock return divided by trading volume.
Proceeds from investment	Cash proceeds from foreign issues.
Total investment	Total foreign investment relative to total debt and equity market capitalisation.
Trading cost	Total transaction cost.
Trading volume	Returns on the total number of transactions.
Turnover ratio	The ratio of trading volume to market capitalisation.
Zero returns	Proportion of trading days with zero daily stock returns out of all potential trading days.
Cost of equity:	
Abnormal earnings	Abnormal earnings growth model assuming long-term growth.
Implied cost of equity	Cost of equity implied in current stock prices and analysts' forecasts.
Price-earnings-growth	Modification of Easton (2004) price-earnings-growth model.
Residual income	Residual income valuation with long-term growth.
Risk premium	The cost of capital in excess of the risk-free rate.
WACC	Weighted average cost of capital.
Cost of debt:	
Implied cost of debt	Interest expense divided by average short- and long-term debt.
Interest-debt ratio	Ratio of interest expense to interest-bearing debts.
Loan spread	The amount that borrowers pay in basis point over LIBOR.
Yield on bonds	The amount that borrowers pay in basis point over a government bond.